



## 2021 Biennial Report Integrated Solid Waste and Resource Management Plan

January 11, 2022

*Note: This document was revised on November 2, 2023 to correct the following:*

- *Tonnages in the last three rows of the "C&D Waste Disposal by Facility (Tonnes)" table on pg.11 were updated to include reported out-of-region tonnage*
- *Tonnages of waste going to landfill on pg.59 were updated to include all construction and demolition waste*
- *The word "biogenic" was removed from the table on pg.59*

# Table of Contents

Table of Contents.....	i
1.0 SUMMARY.....	1
<b>1.1. Summary of ISWRMP Strategies.....</b>	<b>4</b>
<b>1.2. Summary of ISWRMP detailed performance measures .....</b>	<b>9</b>
2.0 DETAILED ISWRMP ACTIONS.....	14
3.0 DETAILED ISWRMP PERFORMANCE MEASURES.....	50

## 1.0 SUMMARY

As part of implementation of the Integrated Solid Waste and Resource Management Plan (ISWRMP), Metro Vancouver reports out once every two years on ISWRMP progress. The biennial report supplements an annual recycling and solid waste management summary. The biennial report includes a summary of ISWRMP strategies, summary of performance measures, and progress on the detailed actions in the ISWRMP.

As of the end of 2020 with a 64% diversion rate and 0.45 tonnes per capita municipal solid waste disposal rate, Metro Vancouver is among the most successful jurisdictions in North America in reducing waste. During the COVID-19 pandemic, Metro Vancouver continued to focus on initiatives to further the goals in the ISWRMP however, like many other jurisdictions, a key focus in 2020 was on maintaining essential services throughout the pandemic. Metro Vancouver recycling and waste centres remained open during the pandemic with updated safety measures, as did private licensed recycling facilities around the region. Certain programs were adjusted or projects completed to reflect emerging issues, such as:

- Metro Vancouver’s illegal dumping campaign pivoted to reflect an increase in littering of disposable PPE items. The updated campaign encouraged residents to properly dispose of PPE by using the “Bag it. Bin it” method.
- A waste composition study was conducted in the fall of 2020 which included new personal protective equipment categories such as masks and wipes.
- To address the limited availability of public washrooms during the first half of 2020, Metro Vancouver created a municipal washroom finder tool to help truck drivers providing essential collection services for garbage, organics and recycling throughout the region access washroom facilities.
- In the initial stages of the pandemic, weekly reports on waste tonnages at Metro Vancouver and City of Vancouver facilities were provided to members for an up-to-date reflection of the impact of COVID-19 on waste disposal. Metro Vancouver also scheduled a series of ongoing emergency meetings with the Regional Engineers Advisory Committee Solid Waste Subcommittee to discuss COVID-related waste management issues of mutual interest amongst member jurisdictions.

Prior to and during the COVID-19 pandemic, a number of new actions have been implemented. These actions are new since the Biennial/5 Year progress report was completed in 2019, and reflect actions to the end of calendar year 2020:

- **Solid Waste Management Plan Update:** Metro Vancouver has initiated the process of updating the solid waste management plan including convening a Solid Waste Management Plan Independent Consultation and Engagement Panel and working on two foundational studies to inform the solid waste management plan update:

- Assessment of Regional Solid Waste System
  - Circular Economy and 3Rs Study
- **Single-use items:** Metro Vancouver conducted a regional study and assessment of single-use item reduction strategies including a jurisdictional scan and research on various policy options leading to the creation of a single-use item reduction toolkit highlighting single-use reduction initiatives. Development of a single-use item reduction campaign began in 2020. Research was conducted, which informed strategy, key messages, and creative approach. Metro Vancouver members and other stakeholders were kept up to date about and provided feedback on campaign development. Metro Vancouver also is currently working with our member municipalities to examine a regional harmonized approach to reducing single-use items, many of which are plastic.
- **Canada Plastics Pact:** In 2019, the National Zero Waste Council worked through the Circular Economy Leadership Coalition (now Circular Economy Leadership Canada) to form the Canada Plastics Pact which launched in 2021. The Canada Plastics Pact is a member of the Ellen MacArthur Foundation’s Global Plastics Pact network, and sets 2025 targets and actions among governments, NGOs and industry to create a circular plastics economy.
- **United Boulevard and Central Surrey Recycling and Waste Centres:** Two new recycling and waste centres are under construction, both of which will provide significantly improved access and expanded recycling services when completed.
- **Waste-to-Energy Facility:** The Ministry of Environment and Climate Change Strategy has authorized the beneficial use of processed bottom ash. Metro Vancouver is procuring pilot studies to process bottom ash as a feedstock to cement kilns for the production of cement clinker. Metro Vancouver has also completed design of a biosolids receiving system at the Waste-to-Energy Facility that would allow for processing up to 25,000 tonnes per year along with the normal processing of municipal solid waste.
- **Commercial Organics:** Metro Vancouver is exploring the feasibility of providing commercial organics transfer services at regional facilities. In 2019, a market sounding was completed to survey the private sector on commercial organics feasibility. Engagement was conducted in 2020 to gain further input on potential options.
- **Alternative Fuels:** In 2020, Metro Vancouver initiated a business casing study examining the potential for a regional alternative fuel and recyclables recovery facility that could extract recyclable materials and create an alternative fuel product from small load waste. Small load waste is delivered in small hand unloaded vehicles and contains a high percentage of wood.

Metro Vancouver’s member municipalities are important partners in achieving the goals of the ISWRMP. Member municipalities have participated in all of the initiatives above, as well as the development and implementation of programs within each municipality which help to further regional waste reduction, re-use and recycling. Some examples includes:

- The City of Vancouver was a leader in research and development of single-use item reduction strategies, including a robust engagement process and the implementation of single use item bylaws beginning with bans on straws and foam cups and take-out containers in 2020, as well as a requirement to provide utensils only by request. Bylaws covering shopping bags and beverage cups take effect on January 1, 2022.
- The City of Surrey's Biofuel Facility which opened in 2018, provides organics processing not only for the City of Surrey, but for other municipalities and commercial entities in the region as well, creating low-carbon biofuel used in their collection fleet. This facility has served as a model for anaerobic digestion locally and continues to operate successfully without significant odour complaints.
- The City of Richmond has championed reuse and recycling in the construction & demolition sector, participating in National Zero Waste Council CRD working groups, initiating successful programs such as their 2020 recycled asphalt pilot and promoting alternatives to conventional demolition such as house moving.
- Several municipalities, including the Township of Langley, the City of Vancouver and the District of West Vancouver, have completed successful pilot studies and are implementing improvements to public space recycling, whether that is making options for streams such as dog waste more widely available , or creating easy to use zero waste stations with consistent diversion options.

## 1.1. Summary of ISWRMP Strategies

### **Strategy 1.1 Advocate that senior governments transfer additional waste management responsibilities to producers and consumers**

The National Zero Waste Council, an initiative of Metro Vancouver, is leading Canada's transition to a circular economy by bringing together governments, businesses and NGOs to advance a waste prevention agenda that maximizes economic opportunities for the benefit of all Canadians. The Council acts collaboratively with business, government and the community, at the national and international level, as an agent of change for waste prevention and reduction in the design, production and use of goods.

The Council was invited by Agriculture and Agri-foods Canada (AAFC) to engage in two separate and distinct ways. First, the Council has been asked to chair the jury for AAFC's Food Waste Innovation Challenge. NZWC was also offered a seat at the Food Policy Advisory Council that is a key component in the development of the Food Policy for Canada. Both offer important opportunities to engage food, community and agriculture leaders on how we can collectively build a better food system for all Canadians in addition to providing advice to the AAFC Minister on current and emerging issues.

In 2020, the National Zero Waste Council released *Less Food Loss and Waste, Less Packaging Waste*, a report that studied the intersection of reducing food loss and waste throughout the food supply chain in Canada with the efforts to reduce packaging. The report established that packaging is fundamental to minimizing food waste and identified practices and policy changes that could lead to reduction of both food waste and packaging waste.

### **Strategy 1.2 Reduce or eliminate materials entering the solid waste system which hinder or limit the opportunities to achieve reuse, recycling, or energy recovery, or that may exacerbate environmental impacts of disposed residuals**

Metro Vancouver continues to implement its disposal bans, which have been enhanced by the implementation of a new paperless disposal ban inspection and surcharge program. All bans continue to be supported with behavior change campaigns, ban enforcement, and educational materials. Challenges in the local availability of processing capacity and markets for materials such as organics, clean wood and waxed cardboard have required occasional temporary relaxation of disposal ban surcharges.

### **Strategy 1.3 Provide information and education on options to reduce waste**

Recent activities include:

- Through the National Zero Waste Council, Metro Vancouver has amplified the reach of the Love Food Hate Waste campaign through the launch of a cross-Canada, bilingual initiative. The campaign includes 9 campaign partners, including Metro Vancouver. Love Food Hate Waste Canada aims to engage Canadians in a national conversation, with consumers hearing

consistent messaging across multiple platforms (e.g., via social media, grocery stores, bus shelters etc.). Working together, Campaign Partners can help Canada meet its international commitments related to climate action and sustainability, align with global best practice, and join the global fight against food waste.

- Through 2019 and 2020, the National Zero Waste Council and Metro Vancouver worked with other national partners to develop and launch the Canada Plastics Pact, which brings together industry leaders, government stakeholders and other key experts to eliminate plastic packaging waste – keeping plastics in the economy and out of the environment.
- Creation of a single-use item reduction toolkit highlighting leading single-use reduction initiatives on a range of policy options.
- Update of the Construction & Demolition Waste Reduction and Recycling Toolkit for the building industry.
- Continued advertising and social media campaigns for Christmas “Create Memories not Garbage”, Organics “Food isn’t Garbage”, and Textiles “Think Thrice”.
- Continued support by Metro Vancouver for the National Zero Waste Council and its various working groups, such as the Food Working Group, its National Food Waste Reduction Strategy and the Construction & Demolition Working Group.

### **Strategy 2.1 Increase the opportunities for reuse**

Recent activities include:

- A regional study and assessment of single-use item reduction strategies including a jurisdictional scan and research on various policy options leading to the creation of a single-use item reduction toolkit.
- Held a pilot re-use day events at Recycling and Waste Centres to provide opportunities for customers to reuse materials intended for disposal.
- Support for municipal and non-profit repair cafes, as well as initiatives such as the Binners’ Project, a local group of waste-pickers aided by support staff dedicated to improving the economic opportunities of binners and reduce the stigma they face.
- In 2018, the Love Food Hate Waste campaign became a national program, including its emphasis on food donation.
- In 2020, Metro Vancouver conducted a procurement process to develop a regional food recovery network to help local organizations rescue and redistribute surplus food, moving food away from landfills and compost, and up the waste hierarchy to feed people and animals.

## **Strategy 2.2 Increase the effectiveness of existing recycling programs**

Recent activities include:

- Implementation of a paperless disposal ban surcharge program to streamline the disposal ban inspection process.
- Working with the BC Use Oil Management Association to develop an agreement for used oil and antifreeze drop-off at the North Shore Recycling and Waste Centre.
- Working with Encorp Pacific to develop an agreement for a Return-it Express & Go beverage container drop-off at the North Shore Recycling and Waste Centre.
- Design and construction of two new recycling and waste centres (in Coquitlam and Surrey), both of which will provide significantly improved access and expanded recycling services when completed.
- Partnering with RCBC to improve regional online recycling resources.
- Continued input into and monitoring of provincial EPR programs.

## **Strategy 2.3 Provide opportunities to increase private sector recycling**

Ongoing activities include periodic review and revision of solid waste regulatory bylaws, studies of recycling market opportunities, and liaison/input into all of BC's various Extended Producer Responsibility programs.

## **Strategy 2.4 Target construction and demolition sector for increased reuse and recycling**

Recent activities include:

- Implementation of a new program for accepting used residential gypsum for disposal at regional recycling and waste centres and new gypsum off cuts for recycling.
- A pilot program for recycling carpeting.
- A business casing study to potentially develop an alternative fuel and recyclables recovery facility which could utilize construction and demolition material along with waste delivered in small vehicles.
- Continued enforcement of a clean wood disposal ban, and provision of clean wood recycling at regional facilities

## **Strategy 2.5 Reduce paper and paperboard being disposed**



The 2014 Extended Producer Responsibility Program for Packaging and Printed Paper (operated by Recycle BC) essentially removed the local governments from a direct role in managing these materials from residential sources..

### **Strategy 2.6 Target organics for recycling and energy recovery**

Recent activities include:

- Exploring the feasibility of providing commercial organics transfer services at regional facilities
- Preliminary discussions of the feasibility of partnerships for co-digestion of food waste
- Continuation of the regional “Food Isn’t Garbage” campaign, the (now-national) Love Food Hate Waste program for residential food waste prevention, and work with the Food Working Group of the National Zero Waste Council.

### **Strategy 2.7 Target wood for reuse, recycling and energy recovery**

Recent activities include a business casing study to potentially develop an alternative fuel and recyclables recovery facility that would focus on waste delivered in small vehicles which contain a high percentage of wood.

### **Strategy 2.8 Target plastics for increased recycling**

The 2014 EPR program for Packaging and Printed Paper (operated by Recycle BC) essentially removed the local governments from a direct role in managing much of the plastic packaging materials from residential sources. However Metro Vancouver continues to provide input to Recycle BC and other EPR programs. The BC Recycling Regulation was amended in 2020 to include single-use items and packaging-like products in future EPR programs.

In 2020, Metro Vancouver participated in the development of the Canada Plastics Pact. Metro Vancouver also provided feedback on provincial and federal work around the reduction of plastics. Metro Vancouver also is currently working with our member municipalities to examine a regional harmonized approach to reducing single-use items, many of which are plastic.

### **Strategy 2.9 Target multi-family and commercial/institutional sectors to improve diversion rates**

Metro Vancouver continues to work with its members, and other stakeholders to provide technical specifications and educational resources, behaviour change campaigns, update building requirements for storage and access, and encourage increased recycling in multi-family and commercial/institutional sectors.

### **Strategy 2.10 Develop contingency plans for the loss of recycling markets**

In 2019, Metro Vancouver and the Province partnered on a Product and Services Gap Analysis of EPR in BC. Marketing of most consumer recyclables in BC have been integrated into provincial EPR programs, and Metro Vancouver maintains continual liaison and input into provincial stewardship planning.

#### **Strategy 2.11 Integrated Utility Management Advisory Committee**

As approved by the Province in 2015, the ISWRMP implementation is now reviewed and critiqued by the Zero Waste Committee, including any resulting public input.

#### **Strategy 3.1 Use waste-to-energy to provide electricity and district heating**

Metro Vancouver is studying the potential for a district energy project utilizing the waste-to-energy.

#### **Strategy 3.2 Recover energy from other solid waste management facilities**

Landfill gas continues to be beneficially used and new opportunities for expanded beneficial use are being pursued for landfill gas generated at the Vancouver Landfill..

#### **Strategy 3.3 Utilize non-recyclable material as fuel**

Metro Vancouver is conducting a feasibility study to explore the development of an alternative fuel and recyclables recovery facility which could utilize non-recyclable material delivered in small vehicles.

#### **Strategy 4.1 Utilize the Vancouver Landfill as a disposal site**

Metro Vancouver continues to use the Vancouver Landfill under the existing agreements.

#### **Strategy 4.2 Ensure a disposal site is available for construction and demolition waste**

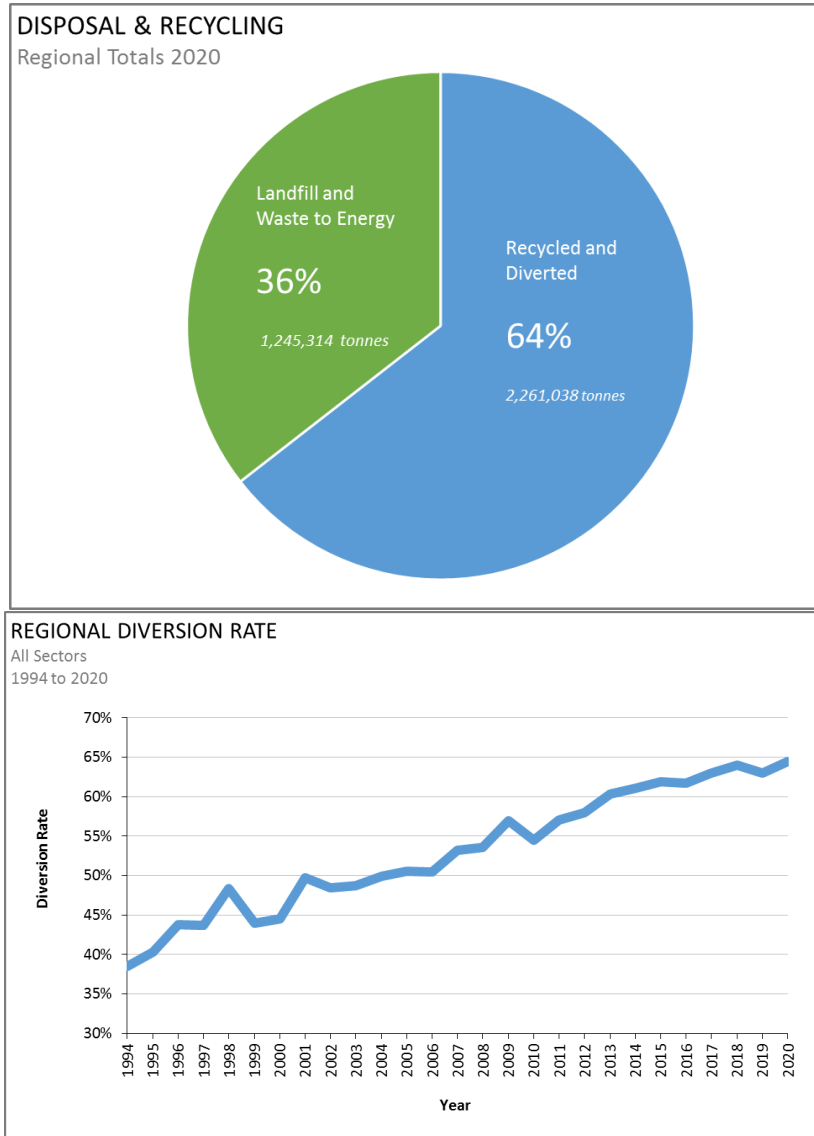
Metro Vancouver continues to monitor the regional disposal capacity for construction and demolition waste which is largely provided by the private sector.

#### **Strategy 4.3 Establish contingency disposal sites**

Metro Vancouver established and makes use of contingency disposal through two three-year contracts with waste shipments starting in April 2018. Contingency disposal waste quantities equaled 56,000 tonnes in 2019, and 35,000 tonnes in 2020.

## 1.2. Summary of ISWRMP detailed performance measures

For calendar 2020<sup>1</sup>, overall waste diversion in the region was estimated to be 64%.

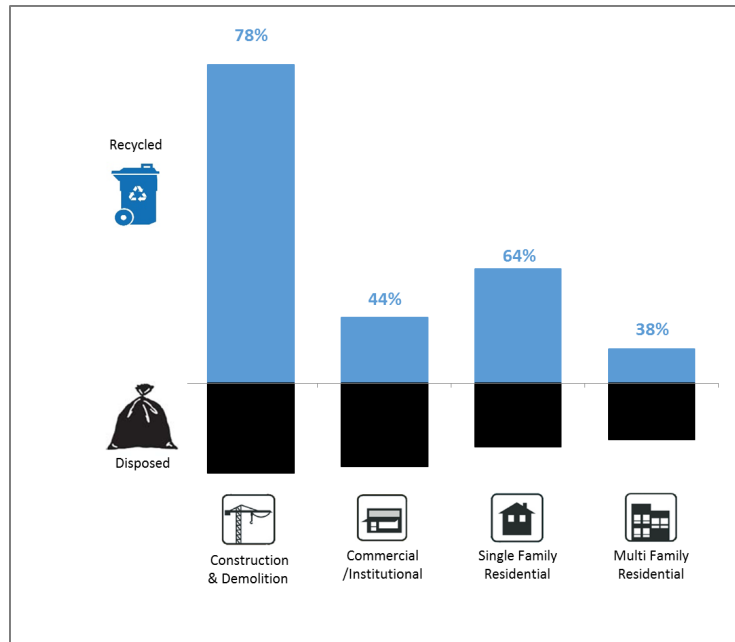


Regional diversion does not include reuse which does not have weight and measurement records of the same type as recycling and disposal. It is estimated that about 61,600 tonnes of materials were reused in the region in 2020.

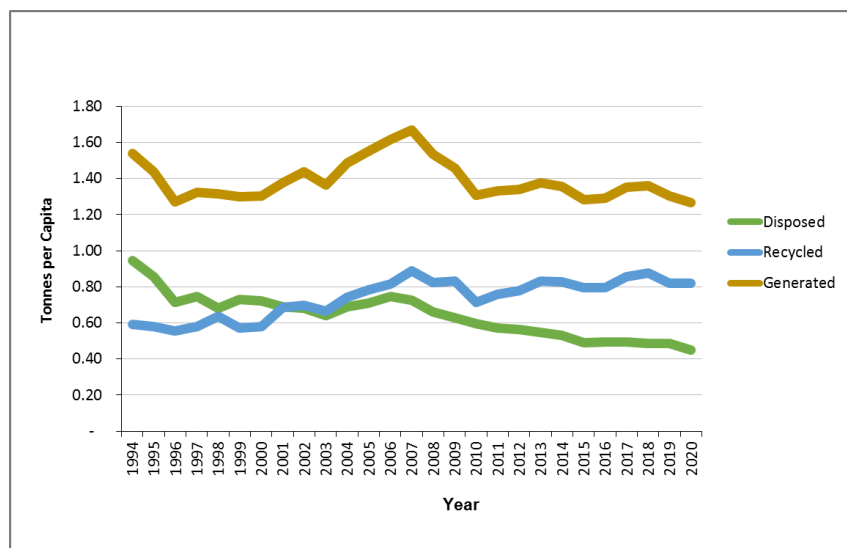
<sup>1</sup> At the time of writing, calendar 2020 was the most recent year for which finalized data was available.

Disposal includes waste disposed of in the Metro Vancouver and City of Vancouver regional solid waste system along with C&D waste disposed through private facilities.

The 2020 waste diversion by individual sectors is illustrated below:

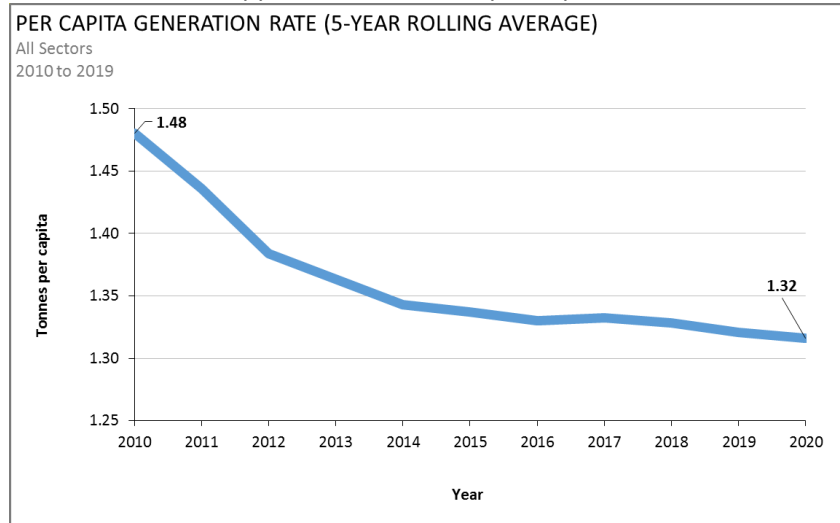


The following chart illustrates historical progress in per capita waste generation, recycling and disposal:



With respect to the region’s waste reduction and recycling goals:

- The amount of waste generated per capita fluctuates, but from its high of 1.6 tonnes per capita in 2007, it has dropped to 1.32 tonnes per capita in 2020



- From 2010 to 2020, the overall diversion (recycling) rate increased from 55% to 64%.
- During the same period, the region reduced its per capita disposal rate from 0.55 tonnes in 2013 to 0.45 tonnes per capita per year in 2020. This takes into account all MSW, including C&D and estimated waste disposed outside of the regional system.

The following table outlines the amount of construction and demolition waste disposed to the Vancouver landfill and to private C&D landfills since 2010:

**C&D Waste Disposal by Facility (Tonnes)**

Year	Vancouver Landfill	Private Facilities	Total
2010	140,734	165,331	306,065
2011	196,498	169,961	366,459
2012	185,317	173,374	358,691
2013	159,303	233,039	392,342
2014	132,721	260,951	393,672
2015	124,044	266,338	390,382
2016	118,168	232,908	351,076
2017	126,513	245,008	371,521
2018	86,663	277,909	364,572
2019	61,178	315,664	376,842
2020	44,138	326,654	370,792

The following table outlines the amount of residential and commercial waste disposed to regional disposal sites, and outside of the regional system since 2010:

#### Residential & Commercial Waste Disposal by Facility (Tonnes)

Year	Cache Creek Landfill	Vancouver Landfill	Waste to Energy	Contingency Disposal	Out of Region (Estimated)
2010	396,384	427,083	284,458		
2011	280,249	456,229	281,139		
2012	242,902	469,273	281,260		50,000
2013	217,072	395,253	280,138		60,000
2014	207,191	355,594	275,260		100,000
2015	206,198	366,123	256,402		30,000
2016	134,866	518,324	254,256		
2017		569,126	259,748	85,779	
2018		611,798	253,126	58,679	
2019		639,474	253,184	55,689	
2020		615,596	244,362	35,340	

The following table outlines the amount of wastes of different types (municipal solid wastes, construction & demolition wastes, wastewater treatment plant residuals, water treatment residuals, bottom ash from the waste-to-energy facility, and industrial waste (e.g. pulp and paper wastes) disposed at the Vancouver landfill since 2010:

#### Vancouver Landfill Waste Tonnages (tonnes)

Year	MSW	C&D	WWTP Residuals	WT Residuals	Bottom Ash	Industrial	Total
2010	427,083	140,734	6,545	6,037	46,410		580,399
2011	456,229	196,498	5,775	6,542	46,027		665,044
2012	469,273	185,317	6,050	7,295	44,925	48,347	716,282
2013	395,253	159,303	7,346	6,731	32,538		601,171
2014	355,594	132,721	7,377	7,595	44,861	599	548,747
2015	366,123	124,044	7,312	9,280	43,413		550,172
2016	518,324	118,168	8,028	3,944	43,068		691,532
2017	569,126	126,513	4,399	1,652	35,013		736,703
2018	611,798	86,663	18,737*	710	0**		717,908
2019	639,474	61,178	20,854*	0	16,755**		738,261
2020	615,596	44,138	37,403*	1,417	41,478		740,032

\* Includes 15,173 tonnes Iona Grit Dump in addition to typical WWTP Residuals

\*\* About 76,000 tonnes of bottom ash from the Waste to Energy Facility was used as part of the construction of the new United Boulevard Recycling and Waste Centre from October 2017 until August 2019.

The following table outlines the amount of fly ash disposed from the waste-to-energy facility since 2010. Fly ash has been managed under contract at a private landfill in Oregon since mid-2017:

**Fly Ash Disposal (Out of Region\*) (tonnes)**

2010	12,265
2011	11,964
2012	11,841
2013	11,710
2014	10,720
2015	9,657
2016	10,268
2017	10,450
2018	10,479
2019	9,888
2020	8,658

\* Fly ash has sent to a private landfill in Oregon since July 2017

## 2.0 DETAILED ISWRMP ACTIONS

<b>Strategy 1.1: Advocate that senior governments transfer additional waste management responsibilities to producers and consumers</b>	
<b>ISWRMP Strategy and Actions</b>	<b>Current Status of Key Strategies and Actions in the ISWRMP</b>
<p><b>1.1.1 MV Will:</b> Advocate that senior governments progressively move towards the prohibition of the manufacture and distribution of non-essential, non-recyclable materials and products.</p> <p><b>1.1.2 MV Will:</b> Advocate that senior governments prohibit the manufacture and distribution of non-recyclable packaging.</p>	<p>The National Zero Waste Council was launched in 2013, and its membership has grown. Advocacy work resides primarily within the four working groups focused on: National Communications Campaigns, Product and Packaging Design, Food, and the Circular Economy. In 2019, the National Zero Waste Council worked through the Circular Economy Leadership Coalition (now Circular Economy Leadership Canada) to form the Canada Plastics Pact which launched in 2021. The Canada Plastics Pact is a member of the Ellen MacArthur Foundation’s Global Plastics Pact network, and sets 2025 targets and actions among governments, NGOs and industry to create a circular plastics economy.</p>
<p><b>1.1.3 MV Will:</b> Strongly advocate for EPR programs to reduce waste disposal through implementation of design-for-environment principles, and best management practices that focus on waste reduction, reuse, and recycling. Offer staffing support for and partnership with Ministry of Environment to help accelerate EPR.</p>	<p>In 2020, Metro Vancouver provided a submission in response to the Ministry of Environment and Climate Change Strategy’s Intentions Paper on Extended Producer Responsibility related to priority products for inclusion in future EPR programs and other policy approaches to reduce waste</p>
<p><b>1.1.4 MV Will:</b> Work with other municipalities and regions across BC, Canada, and internationally, to advocate for more development by senior governments in encouraging and developing incentives, including regulation, that promote design of products with an emphasis on reuse and recycling (cradle-to-cradle design).</p>	<p>This action is primarily covered under 1.1.1 which is Metro Vancouver’s support for and participation in the National Zero Waste Council. See also actions 1.1.2 and 1.3.3. In particular, this is carried out by the Council’s product and packaging design working group:  <a href="http://www.nzwc.ca/focus/design/Pages/default.aspx">http://www.nzwc.ca/focus/design/Pages/default.aspx</a></p>



<p><b>1.1.5 MV Will:</b> Participate on federal EPR initiatives such as the Canadian Council of Ministers of Environment (CCME) Extended Producer Responsibility Task Force, to develop national guidelines for sustainable packaging.</p>	<p>In response to the Ocean Plastics Charter, CCME produced a report “Zero Plastics Waste Strategy”, to help identify key actions and activities to address plastics management. In 2020, CCME developed phase II of the Zero Plastic Waste Action Plan, which focused on consumer awareness, aquatic activities, research and monitoring, clean-up and global action. Ongoing participation in the CCME Waste Management Task Group is through Ministry of Environment staff who are the official participants in these processes. Metro Vancouver contributes to these processes under 1.1.3, which is the joint EPR work with the Ministry of Environment.</p>
<p><b>1.1.6 MV Will:</b> Participate on industry stewardship advisory committees.</p>	<p>Metro Vancouver participates on several advisory groups, including: Electronic Products Recycling Association, Major Appliance Recycling Roundtable, Recycle BC, and Tire Stewardship BC.</p>
<p><b>1.1.7 MV Will:</b> Participate on the BC Product Stewardship Council to assist in evaluating existing and developing new EPR programs.</p>	<p>Metro Vancouver is participating in the BC Product Stewardship Council and continues to participate in its regular meetings.</p>
<p><b>1.1.8 MV Will:</b> Waste projections will consider future trends in population, generation, and management, including EPR.</p>	<p>Solid waste generation and disposal forecasts are continuously improved and updated based on the solid waste system’s most current information. Work on the solid waste projection model is ongoing and continues to help the region to proactively address future solid waste management opportunities and challenges.</p>
<p><b>1.1.9 Municipalities Will:</b> Partner with Metro Vancouver in support of actions 1.1.1 through 1.1.8</p>	<p>This action is ongoing and consists of collaborating on EPR actions 1.1.1 through 1.1.8 with member municipalities through the REAC Solid Waste Sub-committee. A significant point of emphasis is the Recycle BC program for residential packaging and printed paper, including participation in consultations for the new Recycle BC Extended Producer Responsibility Plan.</p>
<p><b>1.1.10 Other Governments &amp; Agencies Will:</b> Ministry of Environment to accelerate EPR program development and implementation.</p> <p><b>1.1.11 Other Governments &amp; Agencies Will:</b> Include Metro Vancouver and its member municipalities in the negotiations with producers regarding future EPR programs to ensure that appropriate consideration is given to the existing convenient curbside collection systems.</p>	<p>These actions are ongoing and a collaborative effort between Metro Vancouver, member municipalities and the Ministry in support of EPR actions 1.1.1 through 1.1.5.</p>

<p><b>1.1.12 Other Governments &amp; Agencies Will:</b> Ensure that the waste recovered under EPR programs will be properly managed in the region and that such materials will not be exported without adequate knowledge of and control over its eventual disposition.</p>	<p>This is a fundamental principle included in all discussions and negotiations with industry, member municipalities and the Ministry of Environment in EPR actions 1.1.1 through 1.1.11</p>
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**Strategy 1.2: Reduce or eliminate materials entering the solid waste system which hinder or limit the opportunities to achieve reuse, recycling, or energy recovery, or that may exacerbate environmental impacts of disposed residuals**

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>1.2.1 MV Will:</b> Work with facility operators, local municipalities and the recycling industry to introduce material bans after alternatives are identified and suitable public information programs.</p>	<p>Public Outreach and Information Programs are primarily covered by the actions in strategy 1.3 to develop and deliver a community-based social marketing program. No new disposal bans were contemplated in 2019 and 2020.</p>

### Strategy 1.3: Provide information and education on options to reduce waste

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>1.3.1 MV Will:</b> Develop and deliver a community- based social marketing program to inform and educate citizens on waste education opportunities including schools.</p> <p>(a) Target a minimum of 70% diversion goal by 2015 over all sectors and an aspirational goal of 80% by 2020 to be featured in communication materials.</p>	<p>Metro Vancouver develops advertising campaigns: Holiday Waste Reduction “Create Memories Not Garbage” campaign; Illegal Dumping “Waste In Its Place” campaign, Organics Diversion “Food Scraps Aren’t Garbage” campaign, and Textile Waste Reduction “Think Thrice About Your Clothes” campaign, among others. Each campaign targeted relevant audiences within the region. Metro Vancouver is also a partner in the National Zero Waste Council’s food waste prevention campaign, “Love Food Hate Waste Canada.”</p> <p>In 2020, Illegal Dumping’s campaign included messaging on wearing and properly disposing of personal protective equipment (PPE) like single-use masks and gloves.</p> <p>Development of a single-use item reduction campaign began in 2020. Research was conducted, which informed strategy, key messages, and creative approach. Metro Vancouver members and other stakeholders were kept up to date about and provided feedback on campaign development.</p> <p>School Districts continue to support waste reduction behaviors, including food scraps recycling in schools. Support for K-12 teaching and learning about waste reduction is provided by Metro Vancouver School &amp; Youth Leadership programs (see 2.2.6).</p>
<p><b>1.3.2 MV Will:</b> Develop and deliver a community-based social marketing business education plan, including business guides and other outreach programs to inform and educate businesses on waste reduction opportunities.</p>	<p>In 2019 Metro Vancouver held a business workshop to support the reduction of single-use items with businesses.</p> <p>In 2019 and 2020 much of the direct business support was through the National Zero Waste Council. For example, the Council developed a Circular Economy Business Toolkit and host several working groups that work collaboratively with non-profits and the government to reduce business waste.</p> <p>In 2019 and 2020, Metro Vancouver completed an update of its construction &amp; demolition toolkit update to further reduce waste in the demolition and construction sectors.</p>
<p><b>1.3.3 MV Will:</b> Develop a national zero waste marketing council so that cities across Canada can pool resources and develop common messaging, with national impact, on the need to reduce waste, resulting in informed and educated citizens on waste reduction opportunities.</p>	<p>This action is fulfilled under 1.1.1 which is Metro Vancouver’s formation of and support for the National Zero Waste Council. The National Zero Waste Council includes in its mandate the sharing of public education and communications resources, with a working group specifically dedicated to that purpose. This work includes best practices guides, and shared resource materials for active campaigns:  <a href="http://www.nzwc.ca/focus/campaigns/Pages/default.aspx">http://www.nzwc.ca/focus/campaigns/Pages/default.aspx</a></p>

<p><b>1.3.4 Municipalities Will:</b> Partner with and assist Metro Vancouver in the development and delivery of public and business information and education programs.</p>	<p>This is an ongoing collaborative relationship between Metro Vancouver and the member municipalities, coordinated through the REAC Solid Waste Sub-committee, as well as the Municipal Waste Reduction Coordinators and other municipal staff, involving the joint development and distribution of information and materials that support all public education strategies and actions of the ISWRMP.</p>
<p>(a) After suitable public information programs, expand disposal bans to include materials encompassed by new EPR programs and material for which new recycling markets are developed.</p>	<p>Disposal bans are in place for all materials included in EPR programs. Materials have been added as new EPR programs are put in place.</p>

## Strategy 2.1: Increase the opportunities for reuse

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>2.1.1 MV Will:</b> Investigate financial and regulatory barriers which prevent or discourage the reuse of materials.</p> <p><b>2.1.2 MV Will:</b> Investigate the effectiveness and adequacy of existing material exchange networks.</p> <p><b>2.1.3 MV Will:</b> Bring forward appropriate measures which respond to the findings of 2.1.1 and 2.1.2.</p>	<p>Metro Vancouver researched and published the results of research on methods to reduce single-use items in the region, include re-use options. Through that research, Metro Vancouver was able to create a single-use item reduction toolkit providing an overview of leading single-use reduction initiatives on a range of policy options and a jurisdictional scan of single-use item policies which have overcome financial and regulatory barriers.</p> <p>In June 2019 Metro Vancouver piloted a reuse education day at the North Shore recycling and waste centre which targeted messaging about reuse opportunities to people bring resellable items for recycling and disposal.</p> <p>In 2020, Metro Vancouver conducted a procurement process to develop a regional food recovery network to help local organizations rescue and redistribute surplus food, moving food away from landfills and compost, and up the waste hierarchy to feed people and animals.</p>
<p><b>2.1.4 MV Will:</b> Enhance partnerships with the Province, industry, academia and community groups to research and develop solutions to overcome barriers to reuse and recycling and new opportunities to re-engineer recycled material.</p>	<p>In 2019, Metro Vancouver worked with RCBC on a compostable plastics workshop.</p> <p>Metro Vancouver partnered with the Binner’s Project to increase the number of coffee cups collected for recycling in the region through the annual Coffee Cup Revolution.</p> <p>Metro Vancouver hired a University of British Columbia regional scholar to investigate the feasibility of an online marketplace for construction and demolition materials.</p>
<p><b>2.1.5 Municipalities Will:</b> Work with Metro Vancouver to give effect to Strategy 2.1.</p>	<p>Municipal collaboration with Metro Vancouver in actions 2.1.1 through 2.1.4 is coordinated through the REAC Solid Waste Sub-committee, Municipal Waste Reduction Coordinators Committee and other municipal staff on an ongoing basis.</p>

## Strategy 2.2: Increase the effectiveness of existing recycling programs

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>2.2.1 MV Will:</b> Implement disposal bans on materials that limit opportunities to achieve reuse, recycling, or energy recovery.</p> <p>(a) Work with facility operators, local municipalities, senior governments and the recycling industry to determine the impact and source of components of the waste stream, the consequence and feasibility of banning materials with the most negative impacts and the most suitable recycling options for those materials.</p>	<p>Metro Vancouver’s disposal ban program has been effective at diverting material from the garbage to recycling. In 2019, implementation of a paperless disposal ban surcharge program helped to streamline the disposal ban inspection process.</p> <p>Metro Vancouver’s waste composition monitoring program annually examines some components of the waste stream to help determine the effectiveness of existing bans and identify items that could be targeted for future bans. In 2020, a new waste composition program plan outlined an increased frequency of composition studies in order to better understand the waste stream, particularly specific sectors such as multi-family buildings and businesses.</p>
<p>(b) Expand the monitoring and enforcement of disposal bans and enhance with effective communications to raise awareness of the bans.</p>	<p>[ACTION COMPLETED]</p> <p>Regional outreach and communication activities supporting awareness of bans were completed under action 1.3.4 which is ongoing collaboration between Metro Vancouver and the member municipalities. From 2010 to 2018 increased number of inspectors from 5 to 9 and number of inspections from 140,000 to 180,000 per year. In 2017, closed circuit technology was installed at the Waste-to-Energy Facility allowing inspection of loads being deposited into the bunker. Inspection rate at the facility increased from 1% to 20% of loads, consistent with other facilities. Metro Vancouver facilities also implemented an electronic surcharge program starting in mid-2019 which improved efficiency and timeliness of disposal ban enforcement.</p>
<p>(c) Analyze the effectiveness of disposal bans and possible alternative enforcement models including enforcement at source.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver worked with a Disposal Ban Effectiveness Working Group of haulers, recyclers and other stakeholders to review implementation of the disposal ban program and receive feedback on proposed changes and communication tools.</p> <p>Metro Vancouver piloted a voluntary hauler incentive program and continues to work with stakeholders to improve disposal bans.</p>
<p>(d) After suitable public information programs, expand disposal bans to include materials encompassed by new EPR programs and material for which</p>	<p>No new bans were initiated in 2019 and 2020, however Metro Vancouver continues to examine and reassess the disposal ban program as well as new EPR programs and recycling markets.</p>

<p>new recycling markets are developed.</p>	
<p><b>2.2.2 MV Will:</b> Provide ongoing information for businesses and residents of recycling opportunities.</p>	<p>MetroVancouverRecycles.org and the Recycling Council of BC's Recyclopedia were effectively merged in 2020, and RCBC maintains both under a service contract to Metro Vancouver. The combined service hosts dynamic websites providing a range of materials and resources on waste reduction, reuse and recycling, including recycling signage for businesses and residents, How-to Guides and Case Studies, and presentations as requested.</p>
<p>(a) Continue to maintain and upgrade a regional web-based database on recycling opportunities for businesses and residents.</p>	<p>MetroVancouverRecycles.org and Recyclopedia are continually maintained and updated to ensure all data is accurate and new functionality responds to users' requirements.</p>
<p>(b) Keep municipalities fully informed as to recycling collection and drop facilities and changes to policies and facilities.</p>	<p>This is an ongoing activity between Metro Vancouver and its member municipalities which is facilitated through the REAC Solid Waste Subcommittee and other municipal staff. This includes annual surveys and compilation of municipal waste and recycling services.</p>
<p>(c) Provide outreach services.</p>	<p>This is primarily covered under strategy 1.3.</p>
<p>(d) Work with other information sources to achieve maximum harmonization possible.</p>	<p>Worked with member municipalities to develop (for example):</p> <ul style="list-style-type: none"> <li>• Consistent messaging and vocabulary on its solid waste campaigns including Food Scraps, Make Memories not Garbage, Waste in its Place, Love Food Hate Waste, Think Thrice About Your Clothes.</li> <li>• Agree to and promote a consistent colour scheme for public recycling facilities and receptacles.</li> </ul> <p>Partner with RCBC on shared recycling messaging, where possible</p>
<p><b>2.2.3 MV Will:</b> Increase the efficiency and consistency of recycling collection services across the region.</p>	<p>Over one-third of residents in Metro Vancouver receive recycling service directly from Recycle BC. Many others are served by their local municipality under contract to Recycle BC. As a result, collection of recyclables from residents has now been standardized for virtually all single-family residents in the region.</p> <p>More than 97% of single family homes in the Metro Vancouver region now receive organics collection.</p>
<p>(a) Work with municipalities to review materials accepted for recycling from residential and Commercial/Institutional sources</p>	<p>[ACTION COMPLETED]</p> <p>Approximately one-third of residents in Metro Vancouver receive recycling service directly from Recycle BC. Many others are served by their local municipality under contract to Recycle BC. As a result, collection of recyclables from residents has now been standardized for virtually all single-family residents in the region. Under provincial regulation, an equivalent EPR program for the Commercial/Institutional sector is expected in the coming years.</p>



<p>(b) In collaboration with municipalities, undertake a business case review of the residential and Commercial/Institutional waste and recycling collection services over the region to determine and implement the appropriate level of consistency between municipalities. Where appropriate, Metro Vancouver will develop model policies or bylaws to assist municipalities in achieving consistency.</p>	<p>Over one-third of residents in Metro Vancouver receive recycling service directly from RecycleBC (formerly MMBC). Many others are served by their local municipality under contract to RecycleBC. As a result, collection of recyclables from residents has now been standardized for virtually all single-family residents in the region.</p> <p>Roughly half of the member municipalities currently have policies and programs (such as mandatory service requirements or diversion plans) to encourage recycling and/or organics collection for multi-family residents, and for Commercial/Institutional businesses.</p>
<p>(c) Analyze the effectiveness of pricing strategies and other economic instruments to encourage additional recycling.</p>	<p>[ACTION COMPLETED]</p> <p>In 2017, Metro Vancouver finalized a consultant study to evaluate vulnerabilities in the Recycling network. The study concluded that much of the ongoing activities and actions already undertaken by Metro Vancouver were appropriate to protect or improve the resiliency of the recycling network.</p>
<p><b>2.2.4 MV Will:</b> Establish Eco-Centres.</p> <p>(a) Establish a stakeholder and municipal work group to determine the scope, terms and conditions and the relationship to existing and planned EPR programs and municipal recycling depots for participating municipalities and industries.</p> <p>(b) Develop the model of Eco-Centres to include numerous, small scale, one-stop-drop centres for recycling and small quantity drop-off disposal.</p> <p>(c) With municipalities, determine the terms and conditions for participating municipalities and industries and develop appropriate business cases.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver has implemented a model where communities served by a recycling and waste centre request and pay for recycling services at that site. The model is in place at the Coquitlam Recycling and Waste Centre and the North Shore Recycling and Waste Centre.</p> <p>Two new recycling and waste centres are currently being constructed which will provide significantly improved user access and recycling services in keeping with the Eco-Centres model.</p> <p>These two new facilities will be a replacement commercial and residential waste and recycling facility in Coquitlam, which will include funding from New Westminster), and a residential waste and recycling facility in Surrey.</p>

<p>(d) After determining terms and conditions, establish the first Eco-Centre in Surrey to replace commitment for residential drop off facility in the 1995 Plan.</p> <p>(e) Progressively expand the Eco-Centre system across the region as municipal business cases determine.</p>	<p>The Central Surrey Recycling and Waste Centre is currently under construction.</p> <p>Metro Vancouver is completing solid waste system assessment which will help to identify opportunities to expand recycling services to all facilities across the region, keeping with Eco-centre principles.</p>
<p><b>2.2.5 MV Will:</b> Promote recycling at festivals and events.</p> <p>(a) Develop a Zero Waste toolkit for festivals and events.</p> <p>(b) Continue to work with municipalities, EPR groups and local community groups to implement waste minimization and recycling at community festivals and events, including conferences and tradeshow.</p> <p>(c) Provide outreach services.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver developed resource materials for public event recycling, including Zero Waste Stations (signage and bins for public event recycling). Many of these activities were coordinated through action 1.3.4 in collaboration with member municipalities. The Zero Waste Stations have been donated to two local non-profit groups (Ridge Meadows Recycling Society and the Tzu Chi Society who maintain the stations and lend them out for use by others.</p>
<p><b>2.2.6 MV Will:</b> Work with school districts and individual schools to promote waste reduction and recycling.</p> <p>(a) Develop instructional programs that encourage waste reduction and recycling both within the schools and at home.</p>	<p>Metro Vancouver K-12 School &amp; Youth Leadership Programs promote waste reduction awareness and actions in schools and communities. K-12 audiences, including students, youth leaders (13-18), K-12 teachers, school districts and other partners in sustainability education were engaged and supported through these core activities in 2020:</p> <ul style="list-style-type: none"> <li>i) Teacher professional development workshops are delivered to inform, inspire and support teachers to integrate connections to waste management and waste reduction through ongoing delivery of K-12 curriculum (In 2020, 9 teacher workshops were delivered to 216 Metro Vancouver teachers.), and;</li> <li>ii) Youth leadership programs equip and support regional high school youth leaders to influence awareness and action for waste reduction and sustainability in school communities. (In 2020, ten regional Youth4Action Leadership events, were delivered to 250+ high school youth-leaders from Metro Vancouver’s 11 school districts;</li> <li>iii) New Solid Waste K-12 Resources, aligned with the BC Curriculum, were developed to support K-12 teaching and learning about regional solid waste and waste reduction.</li> <li>iv) Solid Waste Management Facility Tours for school audiences were suspended due to COVID19. K-12 Audiences were redirected to available K-12 Resources</li> </ul>

<p><b>2.2.7 Municipalities Will:</b> Work with Metro Vancouver on actions designed to:</p> <p>(a) Implement effective disposal bans for collection of municipal waste at source.</p> <p>(b) Inform businesses and residents of recycling opportunities.</p> <p>(c) Increase the efficiency and consistency of recycling collection services over the region.</p>	<p>The implementation of disposal bans and the supporting communications with businesses and residents is primarily covered under action 2.2.2(b) which is the ongoing activity between Metro Vancouver and its member municipalities facilitated through the REAC Solid Waste Sub-committee and other municipal staff.</p>
<p>(d) Establish Eco-Centres</p>	<p>[ACTION COMPLETED]</p> <p>This has been completed under action 2.2.4 (development of an Eco-Centres Business Model).</p>
<p>(e) Promote recycling at community events and festivals.</p>	<p>[ACTION COMPLETED]</p> <p>This has been completed under action 2.2.5 (development of resource materials for public event recycling).</p>
<p>(f) Work with school districts and individual schools to promote waste reduction and recycling.</p>	<p>This is primarily covered under action 2.2.6 which consists of the Metro Vancouver K-12 School &amp; Youth Leadership Programs which promote waste reduction awareness and actions in schools and communities.</p>

## Strategy 2.3: Provide opportunities to increase private sector recycling

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>2.3.1 MV Will:</b> Facilitate the siting of private sector recycling activities.</p> <p>(a) Review the GVS&amp;DD Solid Waste Regulatory Bylaw to facilitate the siting of municipal solid waste facilities that meet municipal bylaws.</p>	<p>Metro Vancouver consulted on proposed updates to Bylaw 181 (which regulates private sector facilities that manage municipal solid waste and recyclable material) that would modernize private sector facility regulation, increase recycling and foster a level playing field among facilities. In late 2017, the GVS&amp;DD Board approved proceeding with changes to Bylaw 181. The Minister of Environment and Climate Change Strategy deferred consideration of the proposed Bylaw 309 pending the review of the region’s solid waste management plan.</p>
<p><b>2.3.2 MV Will:</b> Foster research and market development for recycled materials.</p> <p>(a) Evaluate a business case for a regional scale recycling service delivery model.</p> <p>(b) Review desirability, feasibility and opportunity for establishing a non-profit organization to facilitate the development of recycling businesses and markets, along the lines of the ‘London Remade’ model in the U.K.</p> <p>(c) Subject to the results of 2.3.2 (a) and (b), establish a regional role in processing and marketing of recycled materials, a land acquisition strategy for required recycling facilities, and enhanced policy-based initiatives to promote local recycled content in consumer goods.</p>	<p>[ACTION COMPLETED]</p> <p>In 2017, Metro Vancouver finalized a consultant study to evaluate vulnerabilities in the Recycling network. The study concluded that much of the ongoing activities and actions undertaken by Metro Vancouver were appropriate to protect or improve the resiliency of the recycling network. Furthermore, the increased role of EPR programs (e.g., packaging and printed papers) means that post-collection/recycling processing is no longer within the jurisdiction of local government.</p> <p>The National Zero Waste Council was launched in October 2013. The Council works as a national level advocacy group to address upstream recycling market challenges particularly through the redesign of products and packaging.</p>
<p><b>2.3.3 Municipalities Will:</b> Facilitate the siting of private sector recycling activities.</p> <p>(a) Review zoning bylaws to remove unnecessary impediments to and encourage recycling and material recovery activities in appropriately zoned areas.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver staff reviewed municipal zoning bylaws and interviewed municipal planners and other municipal staff. The review did not identify unnecessary municipal barriers to the development of private recycling facilities. At this time, the main impediment appears to be the high cost of industrial land in the region.</p>
<p><b>2.3.4 Municipalities Will:</b> Work with Metro Vancouver on the evaluation of regional scale recycling facilities and development of recycling markets.</p>	<p>[ACTION COMPLETED]</p> <p>In 2017, Metro Vancouver finalized a consultant study to evaluate vulnerabilities in the Recycling network. The study concluded that much of the ongoing activities and actions undertaken by Metro</p>

	<p>Vancouver were appropriate to protect or improve the resiliency of the recycling network. Furthermore, the increased role of EPR programs (e.g., packaging and printed papers) means that the responsibility for post-collection/recycling processing is no longer within the jurisdiction of local government.</p>
<p><b>2.3.5 Actions Requested of Other Governments and Agencies.</b>          Provincial and Federal Governments to identify and establish minimum post-consumer recycled content requirements for consumer goods.</p>	<p>The Provincial government continues to require EPR programs to report on the 'end-fate' (e.g., reuse, recycling, recovery or garbage) of all their collected materials. Continuous improvements requirements encourage EPR programs to find appropriate markets for collected materials.</p>

**Strategy 2.4: Target construction and demolition (C&D) sector for increased reuse and recycling**

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>2.4.1 MV Will:</b> In collaboration with municipalities and industry groups, develop a process to require C&amp;D recycling at construction/demolition sites.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver in collaboration with member municipalities developed a sample municipal bylaw for encouraging Construction and Demolition (C&amp;D) recycling. Seven municipalities have adopted regulatory measures that establish recycling requirements for demolition material and others are considering adopting a regulatory program. Municipalities continue to share information as they implement their respective demolition recycling requirements.</p>
<p><b>2.4.2 MV Will:</b> Implement waste reduction strategies directed toward diverting C&amp;D waste from disposal while supporting opportunities for beneficial use.</p> <p>(a) Encourage the role of building supply retailers and producers in the collection of C&amp;D material for recycling.</p> <p>(b) Provide areas for separated recyclable C&amp;D materials at Eco-Centres and at transfer stations as they are upgraded.</p>	<p>Metro Vancouver provides a range of recycling services at all of its recycling and waste centres, including wood and other C&amp;D materials to promote recycling and improve convenience for customers, as recycling options for these materials are limited across the region. As Metro Vancouver develops new recycling and waste centres, recycling depots accepting a variety of free and paid recyclables will continue to be included. Metro Vancouver is including infrastructure for recycling of C&amp;D materials in the design of new facilities in keeping with the eco-centres business model.</p> <p>Review of current management practices in the residential C&amp;D industry is ongoing to identify opportunities to minimize contamination of recyclable material and illegal dumping of hazardous C&amp;D material.</p> <p>Metro Vancouver also publishes diversion rates for construction and demolition processing facilities.</p> <p>Metro Vancouver is conducting a business casing study to potentially develop an alternative fuel and recyclables recovery facility which could utilize construction and demolition material along with waste delivered in small vehicles.</p>
<p><b>2.4.3 MV Will:</b> Review existing C&amp;D recycling and processing capacity, project future needs and develop a strategy to address any identified gaps.</p>	<p>Metro Vancouver is assessing the feasibility of C&amp;D processing in the region. Metro Vancouver has initiated a new study to examine the business case for potentially developing an alternative fuel and recyclables recovery facility which could utilize C&amp;D material in addition to small vehicle waste.</p> <p>Metro Vancouver continues to monitor C&amp;D waste flows, trends, and barriers to recycling.</p>

<p><b>2.4.4 Municipalities Will:</b> Work with Metro Vancouver to develop a process to require C&amp;D recycling at construction/demolition sites.</p> <p>(a) Review municipal C&amp;D permitting processes with a view to requiring waste management plans as a condition of such permits.</p> <p>(b) Review the desirability and feasibility of deposit systems or other financial incentives to increase enforcement of C&amp;D waste management plans.</p>	<p>[ACTION COMPLETED]</p> <p>As stated in 2.4.1, several municipalities have implemented tools to encourage demolition material recycling through material management plans and/or deposit systems.</p>
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## Strategy 2.5: Reduce paper and paperboard being disposed

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>2.5.1 MV Will:</b> In collaboration with municipalities, businesses and non-profit organizations, conduct pilot programs to determine the most effective method of reducing unwanted junk mail and other publications and act accordingly on the results.</p> <p><b>2.5.2 MV Will:</b> Promote reduced paper use and increase paper recycling opportunities in the community and businesses.</p>	<p>[ACTION COMPLETED]</p> <p>Junk mail, phone directories, newspapers and other publications delivered to residents are regulated items in Packaging and Printed Paper EPR. As a result, the ability to influence options to manage these materials is no longer within the jurisdiction of local government.</p>
<p>(a) Carry out a community-based social marketing campaign to determine and overcome barriers to reducing the use of and increasing the recycling of paper in schools and community facilities.</p>	<p>This is largely covered under actions in 1.3.1 and 2.2.6 which involve carrying out community-based social marketing programs for neighborhoods and schools to promote waste reduction and increase recycling.</p>
<p>(b) Carry out a targeted outreach campaign to business to determine and overcome barriers to reducing the use of and increasing the recycling of paper.</p>	<p>Supported by actions under 2.2.2.</p>
<p><b>2.5.3 Municipalities Will:</b> Collaborate with Metro Vancouver in junk mail reduction pilot programs and community-based social marketing programs in community facilities.</p>	<p>[ACTION COMPLETED]</p> <p>Junk mail, phone directories, newspapers and other publications delivered to residents are regulated items in Packaging and Printed Paper EPR. As a result, there is a limited role for local governments to influence options to manage these materials.</p>



## Strategy 2.6: Target organics for recycling and energy recovery

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>2.6.1 MV Will:</b> Evaluate options for processing and utilization of organics with biosolids and other utility residuals.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver evaluated a wide range of different concepts to integrate the replacement of the Lions Gate Wastewater Treatment Plant with new community spaces, commercial ventures, environmental features, and opportunities to co-manage solid wastes such as source-separated organics. Results of the business casing indicated that the cost of co-processing large amounts of source-separated organics together with wastewater residuals such as biosolids would be cost-prohibitive. However, a limited amount and types of select source-separated organics continue to be processed at suitable existing wastewater treatment facilities operated by Metro Vancouver.</p> <p>Metro Vancouver has completed design of a biosolids receiving system at the Waste-to-Energy Facility that would allow for processing up to 25,000 tonnes per year along with the normal processing of municipal solid waste.</p>
<p><b>2.6.2 MV Will:</b> Divert organics from the waste stream.</p> <p>(a) Establish additional organics processing facilities.</p>	<p>Metro Vancouver’s overall diversion rate is 64% with an organics diversion rate of 67% or about 410,000 tonnes a year. Organics recycling increased by 60% between 2013 and 2018 as a result of municipalities implementing municipal organics programs, private sector hauling partnerships and Metro Vancouver’s Organics Disposal Ban. Today, there is very little organics remaining in single family garbage. The greatest opportunity for increasing organics recycling lies in the commercial and multi-family residential sectors. Organics generation in the commercial sector decreased notably during the peak periods of public health restrictions during the COVID-19 pandemic. Metro Vancouver will continue to reassess trends going forward through waste composition studies and the annual report process.</p> <p>To respond to the processing challenges in the commercial and multi-family sectors, in July 2019, the Metro Vancouver Board approved proceeding with a business case to explore the provision of commercial organics transfer services. In 2020, a market sounding was completed as well as engagement on commercial organics options.</p>

<p>i) establish a system for monitoring emissions from organics processing facilities including bioaerosols.</p>	<p>[ACTION COMPLETED]</p> <p>Under provincial legislation, Metro Vancouver has the delegated authority for air pollution control and air quality management in the region. Metro Vancouver issues permits that include requirements for the management of odour and other air emissions, as well as monitoring and assessment.</p>
<p>(b) Determine which paper and paperboard products are suitable for processing at an organics management facility.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver convened a Foodware and Food-Soiled Paper Task Group to identify potential issues and solutions regarding food-soiled paper and the compostable foodware value chain. The Group explored the complexity of the food-soiled paper value chain identified key challenges and recommendations for moving forward.</p> <p>Metro Vancouver also worked through the Product Design &amp; Packaging Working Group of the National Zero Waste Council, seeking to simplify compostable product design and increase transparency in the marketplace around recyclable and compostable packaging.</p>
<p>(c) In collaboration with municipalities, develop and implement a work plan for the diversion of organic waste, including food waste from:</p> <ul style="list-style-type: none"> <li>i) single family residences</li> <li>ii) multi-family residences</li> <li>iii) Commercial/Institutional sector</li> </ul>	<p>[ACTION COMPLETED]</p> <p>Under an ongoing collaborative relationship between Metro Vancouver and the member municipalities, Metro Vancouver supports residents of single family homes through online searchable information focussed on mobile applications, establishing and promoting a hotline, and providing translated educational materials into additional languages.</p> <p>Metro Vancouver supports residents of multi-family homes through convening property managers, capturing experiences for case studies, engaging member municipalities on their pilot multi-family programs to share learning, developing and promoting resources such as the Multi-Family Recycling Toolkit to help improve recycling in their buildings, including food scraps.</p> <p>The <i>Food isn't Garbage</i> campaign informs and encourages all groups to recycle organic materials. The <i>Love Food Hate Waste</i> campaign focusses on food waste reduction and in 2018 was expanded to be a nationwide program.</p> <p>Work with the Commercial/Institutional sector is outlined in 1.3.2</p>

<p>(d) Develop and implement supporting communication programs for 2.6.2 (c).</p>	<p>[ACTION COMPLETED]</p> <p>As described above, the <i>Food isn't Garbage</i> campaign and the now-national <i>Love Food Hate Waste</i> campaign have been ongoing communications programs since their inceptions. In addition, Metro Vancouver has conducted Commercial/Institutional audience research, best practice pilots with local sports teams (Vancouver Whitecaps at Swangard Stadium, Vancouver Canucks), delivered waste reduction and recycling information at Commercial/Institutional trade shows, and has developed an organics waste diversion guide for restaurants (newly updated in 2018), and new web-based resources for Commercial/Institutional businesses.</p> <p>See also action 1.3.4</p>
<p>(e) Ban all compostable organics allowed in residential green bins from disposal to landfills and all forms of waste-to-energy, except anaerobic digestion.</p>	<p>[ACTION COMPLETED]</p> <p>This action was completed under 1.2.1, Metro Vancouver's implementation of the disposal ban for organics.</p> <p>See also actions 2.2.1, 2.6.2, and 2.7.5</p>
<p><b>2.6.3 Municipalities Will:</b> In collaboration with Metro Vancouver, develop and implement a work plan, including appropriate communication programs for the diversion of organic waste from:</p> <ul style="list-style-type: none"> <li>i) single family residences,</li> <li>ii) multi-family residences,</li> <li>iii) the Commercial/Institutional sector</li> </ul>	<p>[ACTION COMPLETED]</p> <p>This is primarily covered under 1.3.4 which is ongoing collaboration between Metro Vancouver and the member municipalities for joint development and sharing of information and materials</p> <p>See also action 2.6.2(c) and (d)</p>
<p>(a) Municipalities will divert organics from the waste stream to a Metro Vancouver or alternative licensed organics processing facility.</p> <p>(b) Municipalities will report the tonnage of diverted organic waste to Metro Vancouver in the event that organics are delivered to licensed non-regional processing facilities.</p>	<p>[ACTION COMPLETED]</p> <p>More than 97% of all the single-family homes in Metro Vancouver receive organics recycling services from their respective municipalities. Many of the member municipalities also provide service to multi-family residences, and some offer or are piloting services to schools and businesses.</p> <p>All municipalities provide regular tonnage information to Metro Vancouver.</p>

<b>Strategy 2.7: Target wood for reuse, recycle, and energy recovery</b>	
<b>ISWRMP Strategy and Actions</b>	<b>Current Status of Key Strategies and Actions in the ISWRMP</b>
<p><b>2.7.1 MV Will:</b> Encourage reuse of wood.</p> <p>(a) Examine and, where feasible, implement incentives for reuse and remove barriers to reuse of wood waste.</p>	<p>Metro Vancouver continues to support City of Vancouver on their Green Demolition Bylaw amendment that implements minimum reuse and recycling requirements for demolition of houses built before 1950, and deconstruction requirements for pre-1910 and heritage-listed homes. Several deconstruction projects have been completed in Vancouver recently, which led to significant wood salvage and reuse. In addition, Metro Vancouver continues to support other member municipalities as they develop similar bylaws.</p> <p>Metro Vancouver continues to research North American cities such as Portland that have successfully implemented deconstruction requirements and conduct comparative analysis to identify policy and/or regulatory framework that can lead to increased wood salvage.</p> <p>In 2019 a number of reuse events were piloted at regional facilities.</p> <p>See also actions 2.1.4, and 2.4.2(a)</p>
<p>(b) Develop and implement information and education programs on the reuse and effective recycling of wood and other C&amp;D waste.</p>	<p>[ACTION COMPLETED]</p> <p>This was completed under 1.3.4 which is ongoing collaboration between Metro Vancouver and the member municipalities for the joint development and sharing of information and materials.</p>
<p><b>2.7.2 MV Will:</b> Collect wood for reuse, recycling, and energy recovery at regional transfer stations and Eco-Centres.</p>	<p>[ACTION COMPLETED]</p> <p>This was completed under 2.4.2 which is Metro Vancouver's provision of space at most existing and future regional facilities for collection of clean wood and reusable building materials.</p>
<p><b>2.7.3 MV Will:</b> Encourage highest and best use for wood following waste management hierarchy in the following priority:</p> <p>(a) Reuse wood for comparable structural and non-structural applications.</p> <p>(b) Recycle wood fibre into other fibre based products.</p> <p>(c) Compost wood with other organic materials.</p>	<p>Metro Vancouver continues to monitor the end markets for wood and investigate ways to support more recycling and reuse in this sector, including:</p> <ul style="list-style-type: none"> <li>-Exploring options for the highest and best use of wood through the University of British Columbia Sustainability Scholars Program. Recent projects include evaluating the creation of an online marketplace and explore solutions to overcome barriers to reuse of salvaged building materials (mainly wood) in the region.</li> <li>-Business casing producing alternative fuel from wood and other material from the C&amp;D sector as well as from material dropped-off at recycling and waste centres in small vehicles (see 2.4.3)</li> </ul>

<p>(d) Digest wood to produce biofuels. (e) Process wood as a fuel for energy production.</p>	<p>-receiving clean wood at recycling and waste centres.</p>
<p><b>2.7.4 MV Will:</b> Pass by-laws as required to support highest and best use of wood as outlined in 2.7.3. <b>2.7.5 MV Will:</b> Ban all wood from landfill disposal.</p>	<p>[ACTION COMPLETED]</p> <p>Metro Vancouver introduced a Clean Wood Disposal Ban at regional facilities on January 1, 2015. Metro Vancouver conducted research into higher uses and markets for wood waste, but cannot identify further regulatory measures due to high costs of land, inability to control the flow of wastes, and technology limitations.</p>
<p><b>2.7.6 Other Governments &amp; Agencies Will:</b> Provincial Government to expand the inclusion of the reuse of wood in building codes.</p>	<p>In the CCME report “Progress Report on the Canada-wide Action Plan on EPR”, CCME scaled back performance expectations for the Action Plan. As a result, the timeline for provincial actions related to EPR for construction and demolition materials, or other potential measures adopted in the BC Building Code is unknown.</p>

<b>Strategy 2.8: Target plastics for increased recycling</b>	
<b>ISWRMP Strategy and Actions</b>	<b>Current Status of Key Strategies and Actions in the ISWRMP</b>
<p><b>2.8.1 MV Will:</b> Expand the recycling of plastics in the residential and commercial sectors.</p> <p>(a) Establish a standard for municipal programs for collection of plastics based on market strength.</p>	<p>[ACTION COMPLETED]</p> <p>Over one-third of residents in Metro Vancouver receive recycling service directly from RecycleBC (formerly MMBC). Many others are served by their local municipality under contract to RecycleBC. As a result, collection of recyclables from residents is mostly standardized. Under provincial regulation, an equivalent EPR program for the Commercial/Institutional sector is expected in the coming years.</p>
<p>(b) In cooperation with retail partners and municipalities, undertake social marketing pilot programs to reduce the use of disposable take-out food and beverage packaging including plastic and other disposable bags.</p>	<p>In 2020, Metro Vancouver started work on a behaviour change campaign to target single-use item reduction for residents. The campaign focus is on priority items, including single-use checkout bags, straws, utensils, take-out containers and cups.</p>
<p><b>2.8.2 Municipalities Will:</b> Work with Metro Vancouver on programs to reduce the use of disposable take-out food and beverage packaging including plastic and other disposable bags.</p>	<p>Metro Vancouver continues to provide input into residential packaging EPR programs which now manage much of the disposable food and beverage packaging materials.</p> <p>In 2020, Metro Vancouver participated in the Canadian Plastic Pact which aims to bring industry, government and other key stakeholders together to reduce plastic waste and increase plastic recycling in Canada.</p> <p>Metro Vancouver is also currently working to reduce Single-Use Items, including:</p> <ul style="list-style-type: none"> <li>In 2019 Metro Vancouver released a Single-Use Item Reduction Toolkit to provide its member municipalities with single-use item reduction resources and best practices to support them in their initiatives and promote regional harmonization</li> </ul>
<p><b>2.8.3 Other Governments &amp; Agencies Will:</b> The Provincial Government to develop EPR programs for all plastics that provide incentives for alternatives to non-recyclable plastics.</p> <p><b>2.8.4 Other Governments &amp; Agencies Will:</b> The Provincial and Federal Governments to require all</p>	<p>[ACTION COMPLETED]</p> <p>Over one-third of residents in Metro Vancouver receive recycling service directly from RecycleBC (formerly MMBC). Many others are served by their local municipality under contract to RecycleBC. As a result, collection of recyclables from residents is mostly standardized. Under provincial regulation, an equivalent EPR program for the Commercial/Institutional sector is expected in the coming years.</p>

<p>plastic material sold in BC to have a material code identifying its composition.</p>	<p>Metro Vancouver staff provided feedback on the Government of Canada's <i>A Proposed Integrated Management Approach to Plastic Products</i> discussion paper</p>
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**Strategy 2.9: Target multi-family and commercial and institutional (Commercial/Institutional) sectors to improve diversion rates**

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>2.9.1 MV Will:</b> Develop bylaws to require recycling in all multi-family and commercial buildings and complexes.</p> <p>(a) Develop a model bylaw and enforcement model to require recycling in multi-family and commercial buildings.</p>	<p>Metro Vancouver continues to work with member municipalities to implement further programs and policies to encourage recycling in multi-family and commercial complexes.</p> <p>One of the key goals of the recently proposed Bylaw 307 was Hauler Licensing requirements which would include mandatory provision of recycling services to all commercial/institutional customers.</p>
<p>(b) Create an advisory service for recycling programs for multifamily and commercial buildings.</p>	<p>[ACTION COMPLETED]</p> <p>This is largely covered under actions 1.3.1 and 1.3.4 which involves the collaboration of member municipalities with Metro Vancouver to develop and deliver community-based marketing programs to inform and educate citizens on waste reduction opportunities.</p> <p>In addition, Metro Vancouver co-founded (with UBC) a municipal waste Research Collaborative to identify and carry out waste-related research in the region. An offshoot of that collaborative is a Multi-Family Organics Diversion Working Group.</p>
<p><b>2.9.2 Municipalities Will:</b> Work with Metro Vancouver to implement recycling in multi-family and commercial buildings.</p>	<p>This is largely covered under actions 1.3.1 and 1.3.4 which involves the collaboration of member municipalities with Metro Vancouver to develop and deliver community-based marketing programs to inform and educate citizens on waste reduction opportunities.</p>
<p><b>2.9.3 Other Govt's &amp; Agencies Will:</b> The Provincial Government to modify the BC Building Code to require that space be provided for recycling collection, sorting and pick-up in multi-family residential and commercial buildings.</p>	<p>Under action 2.9.1, Metro Vancouver updated the technical specifications for recycling storage space and access to reflect changes to collection services resulting from RecycleBC's program. Several municipalities have adapted the technical specifications to their needs and implemented them as part of development permit requirements.</p> <p>Metro Vancouver is working with the Ministry of Municipal Affairs and Housing's Office of Housing and Construction Standards to update the local government building requirements in the <i>Building Act</i> for storage and access in garbage and recycling rooms at multi-family &amp; Commercial/Institutional buildings.</p>



**Strategy 2.10: Develop contingency plans for the loss of recycling markets**

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>2.10.1 MV Will:</b> Manage diverted materials in accordance with the requirements of the Environmental Management Act and regulations in that material will not be disposed unless all feasible opportunities for higher uses of the materials have been taken.</p> <p><b>2.10.2 Municipalities Will:</b> Manage diverted materials in accordance with the requirements of the Environmental Management Act and regulations in that material will not be disposed unless all feasible opportunities for higher uses of the materials have been taken.</p>	<p>[ACTION COMPLETED]</p> <p>In 2017, Metro Vancouver finalized a consultant study to evaluate vulnerabilities in the Recycling network. The study concluded that much of the ongoing activities and actions undertaken by Metro Vancouver were appropriate to protect or improve the resiliency of the recycling network. Furthermore, the increased role of EPR programs (e.g., packaging and printed papers) means that post-collection/recycling processing is no longer within the jurisdiction of local government.</p> <p>In 2019, Metro Vancouver also partnered with the Province to conduct a Product and Services Gap Analysis of EPR in BC. Marketing of most consumer recyclables in BC have been integrated into provincial EPR programs, and Metro Vancouver maintains continual liaison and input into provincial stewardship planning.</p> <p>Compliance with applicable regulations is an ongoing responsibility with all actions associated with the ISWRMP. As described in actions 2.1.1 and 2.3.2, Metro Vancouver is engaged in various activities to improve markets for key recycled materials, especially compost and reusable building materials.</p>

**Strategy 2.11: Integrated Utility Management Advisory Committee**

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>2.11.1 MV Will:</b> Establish a new overarching committee, the Integrated Utility Management Advisory Committee (IUMAC), to advise Metro Vancouver on plan implementation, particularly from the perspectives of integrated planning and resource recovery across utility systems.</p>	<p>[ACTION COMPLETED]</p> <p>In 2015, Metro Vancouver obtained Ministry approval to modify its approach and separate the monitoring of the solid and liquid waste utilities' Plans.</p> <p>ISWRMP implementation is reviewed and critiqued by the Zero Waste Committee, a functional committee of the GVS&amp;DD Board. As reports to the Zero Waste Committee and Board are public, their reviews are supplemented by any public input received.</p>

**Strategy 3.1: Use waste-to-energy to provide electricity and district heating**

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>3.1.1 MV Will:</b> Continue use of existing waste-to-energy facility in Burnaby.</p> <p>(a) Subject to the limitations established in the section titled “Flow Control”, use the facility at its current usage and capacity of 280,000 tonnes per year to recover available energy in the waste remaining after recycling for district energy and electricity generation.</p>	<p>Continue to work with WTEF facility operator to maximize electricity generation from the facility.</p> <p>Metro Vancouver is exploring the potential to develop a district energy system utilizing heat from the Waste-to-Energy facility.</p>
<p>(b) Continue to meet the monitoring and emission requirements in Appendix A.</p> <p>(c) Continue to improve environmental performance of the facility with improved technologies and monitor performance to ensure compliance with applicable legislation and regulations.</p> <p>(d) Operating performance will continue to be reported on a regular and timely basis and will also be available on the Metro Vancouver web site.</p>	<p>(b) The Ministry of Environment issued an Operational Certificate for the existing Waste-to-Energy Facility in December 2016; this Certificate incorporates the emission objectives outlined in the Ministry’s 2011 Policy “Guideline for Emissions from Municipal Solid Waste Combustion”. The Operational Certificate was amended in 2020. These monitoring requirements supersede the monitoring and emission requirements of the ISWRMP appendix A.</p> <p>Per the Operational Certificate, compliance summaries were reported monthly to the Ministry of Environment.</p> <p>In 2020, the Facility was in full compliance with the standards set out in the Operational Certificate, with no exceedances.</p> <p>Year to date 2021, the Facility is in full compliance with the standards set out in the Operational Certificate.</p> <p>c) in 2018, Metro Vancouver completed the installation of non-ferrous recovery system to enable the recovery of non-ferrous metals such as aluminum and copper and secondary recovery of ferrous metal. Approximately 260 tonnes of non-ferrous metals and 420 tonnes additional ferrous metals are recovered each year.</p> <p>d) Operating performance is reported to Ministry of Environment, Fraser Health Authority and City of Burnaby on a monthly basis. Emission data are posted on Metro Vancouver’s website quarterly following receipt of manual stack test results. Continuous Emissions Monitoring data is available on the Metro Vancouver website in real time.</p> <p>e) Metro Vancouver’s Waste-to-Energy Facility in Burnaby continues to comply with all legislation. Metro Vancouver has completed dispersion modelling and a public health risk</p>

<p>(e) The waste-to-energy facility in Burnaby will comply with applicable legislation and operating contracts may include penalties for any violations of performance criteria.</p>	<p>assessment as required by the Operational Certificate. These reports are available on the Metro Vancouver website.</p>
<p><b>3.1.2 MV Will:</b> Expand the use of waste-to-energy.</p> <p>(a) Establish up to 500,000 tonnes per year of new waste-to-energy capacity within the region in one or more facilities.</p> <p>(b) Ensure implementation of new waste-to-energy capacity maximizes energy recovery for use in district heating, production of alternative fuels, industrial applications and electricity generation.</p>	<p>The procurement process for New WTE has been discontinued.</p>
<p>(c) Monitor trends in waste reduction, recycling and waste flows and implement additional waste-to-energy capacity if, and only if, justified on the basis of these trends.</p>	<p>Waste flows and trends are monitored on a regular basis by Metro Vancouver as a component of 1.1.8 the results of which are used for forecasting system needs and adjustments.</p>
<p>(d) Scale any additional waste-to-energy capacity so that total waste-to-energy capacity in the region does not exceed the most probable minimum waste flow projected over the economic life of those facilities.</p>	<p>The procurement process for New WTE has been discontinued.</p>
<p>(e) Operating performance will be reported on a regular and timely basis and will also be available on the Metro Vancouver web site. Any new waste-to-energy facility will comply with applicable legislation and operating contracts may include penalties for any violations of performance criteria.</p>	<p>The procurement process for New WTE has been discontinued.</p>

<p><b>3.1.3 MV Will:</b> Locate new waste-to-energy capacity within the Region on the basis of: site availability; suitability of site for providing district heating from recovered energy; potential for site to optimize network of transfer stations; results of local screening level impact assessment and triple bottom line analysis; and results of community consultation process for each potential site.</p>	<p>The procurement process for New WTE has been discontinued.</p>
<p><b>3.1.4 MV Will:</b> Ensure that new waste-to-energy facilities are designed to maximize the environmental, financial and social benefits of facilities. (a) Evaluate cost/benefits of proposed new facilities over their lifetime, including construction, commissioning, operation and maintenance, future retrofits and decommissioning impacts, and ownership structure.</p>	<p>The procurement process for New WTE has been discontinued.</p>
<p>(b) Conduct an environmental impact assessment of a waste-to-energy facility(ies), based on applicable provincial and federal government requirements, including an assessment of human health risk acceptable to the applicable health authority.</p>	<p>The procurement process for New WTE has been discontinued.</p>
<p>(c) Evaluation criteria will include: cost; use of best available commercial technology; air emission and health impacts; GHG emissions; alignment with sustainability principles; electricity, district heating and alternative fuel production; beneficial use of ash; metals recovery; potential local job creation; and opportunities for research and education.</p>	<p>The procurement process for New WTE has been discontinued.</p>
<p><b>3.1.5 MV Will:</b> Recover metals, ash or other residues from new and existing waste-to-energy facilities for beneficial use. (a) Work with regulatory agencies to identify and remove barriers to beneficial use of ash.</p>	<p>The Ministry of Environment and Climate Change Strategy has authorized the beneficial use of processed bottom ash. Metro Vancouver is procuring pilot studies to process bottom ash as a feedstock to cement kilns for the production of cement clinker.</p>
<p>(b) Maximize metal recovery from the waste stream after recycling.</p>	<p>A non-ferrous recovery system was commissioned in 2018, recovering approximately 260 tonnes per year of non-ferrous metals (primarily aluminum and copper) and an additional 420 tonnes per year of additional ferrous metals.</p>

<p>(c) Process bottom and fly ash to generate products for beneficial use.</p> <p>(d) Use processed bottom and fly ash beneficially for highest value applications available.</p>	<p>Metro Vancouver has initiated procurement for pilot tests to process bottom ash for beneficial use at a cement kiln.</p> <p>To date, about 76,300 tonnes of bottom ash has been used in the construction of the new United Boulevard Recycling and Waste Centre.</p>
<p>(e) If beneficial use of a residue is not reasonably available, dispose of the residue in accordance with applicable legislation.</p>	<p>Fly ash is being shipped to the private Columbia Ridge landfill in Oregon, following a procurement process completed in mid-2017. As noted in the table in section 1.2, that amounts to about 10,000 tonnes per year of fly ash.</p>
<p><b>3.1.6 MV Will:</b> Recover energy from regional utility materials that cannot be recycled, including liquid waste and water utilities.</p> <p>(a) Recover energy from drinking water treatment processes, such organic filter media that cannot be recycled.</p> <p>(b) Use waste-to-energy to process grit and screenings from wastewater treatment for beneficial uses, where appropriate.</p> <p>(c) Use reclaimed water from wastewater treatment plants in waste-to-energy steam generation or district heating, if viable.</p>	<p>[ACTION COMPLETED]</p> <p>Drinking water residuals are being used at the Lafarge Canada cement plant.</p> <p>All wastewater treatment plant screenings are being managed at the Waste to Energy Facility.</p> <p>Metro Vancouver has completed design of a biosolids receiving system at the Waste-to-Energy Facility that would allow for processing up to 25,000 tonnes per year along with the normal processing of municipal solid waste.</p>

**Strategy 3.2: Recover energy from other solid waste management facilities**

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>3.2.1 Municipalities (City of Vancouver) Will:</b>                      Recover landfill gas from Vancouver Landfill and strive to maximize the beneficial use of the recovered gas.</p>	<p>The City of Vancouver continues to beneficially use its landfill gas.                       BC Utilities Commission approved a landfill gas agreement with Fortis in October, 2019</p>

### Strategy 3.3: Utilize non-recyclable material as fuel

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>3.3.1 MV Will:</b> Direct recoverable loads of combustible material received at transfer stations to public or private energy recovery facilities.</p>	<p>Metro Vancouver has a study underway to potentially develop an alternative fuel and recyclables recovery facility which could utilize construction and demolition material along with waste delivered in small vehicles.</p> <p>Metro Vancouver is also exploring the feasibility of C&amp;D Processing in the region, including an analysis of business models and a potential business case.</p>
<p><b>3.3.2 Municipalities (City of Vancouver) Will:</b> Collaborate with Metro Vancouver in ensuring action 3.3.1 is carried out at solid waste management facilities operated by the City of Vancouver.</p>	<p>The City of Vancouver is looking at options for material recovery at the Vancouver Landfill.</p>
<p><b>3.3.3 Other Governments and Agencies Will:</b> Provincial Government to develop material and energy requirements for existing and future stewardship programs to use the non-recyclable portion of returned material as fuel rather than landfilling.</p>	<p>EPR programs are required to report on the ‘end-fate’ of collected materials (i.e., the amount of material that is reused, recycled, recovered for energy and disposed). Continuous improvement requirements leverage EPR program efforts to move up the hierarchy.</p>



## Strategy 4.1: Utilize the Vancouver Landfill as a disposal site

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>4.1.1 MV Will:</b> Use the Vancouver Landfill to dispose of any remaining waste not directed to waste-to-energy facilities.</p> <p>(a) Metro Vancouver will work with the City of Vancouver and Corporation of Delta to reduce the quantity of waste going to the Vancouver Landfill to a maximum of 100,000 tonnes annually, exclusive of waste-to-energy residuals, by 2020. Should these reductions not be achieved because overall waste flows exceed the combined capacity of disposal options, Metro Vancouver will evaluate cost effective alternatives and if appropriate seek an amendment to this Plan to expand waste-to-energy capacity to further reduce waste flows to the Vancouver Landfill.</p>	<p>With the discontinuation of the procurement process for new Waste-to-Energy capacity, Metro Vancouver will continue to utilize the Vancouver Landfill within the limits of its Operational Certificate.</p>
<p>(b) Monitor the Vancouver Landfill to ensure compliance.</p>	<p>The City of Vancouver generates an annual landfill report that includes monitoring data, to meet OC requirements for submittal to the Ministry of Environment and Climate Change Strategy.</p>
<p><b>4.1.2 MV Will:</b> Report annually on the remaining capacity of the waste management system and prior to the closure of Vancouver Landfill, reassess the region's waste-to-energy and disposal options.</p>	<p>As published in its 2020 Annual Recycling and Solid Waste Management Summary report, the region disposed of 1.25 million tonnes of municipal solid waste in 2020, which was adequately accommodated with the regional disposal system composed of the Vancouver Landfill, the Waste-to-Energy Facility, two regionally-contracted contingency landfills, and private C&amp;D waste disposal facilities.</p>
<p><b>4.1.3 Municipalities (City of Vancouver &amp; Delta) Will:</b> Work with Metro Vancouver to accommodate residual waste flows at the Vancouver Landfill.</p>	<p>Metro Vancouver works with Vancouver and Delta to optimize the use of the Vancouver Landfill.</p>
<p><b>4.1.4 Municipalities (City of Vancouver &amp; Delta) Will:</b> Where limits in the Operational Certificate, contracts, agreements and regulations appear to conflict with the Plan, review the particular provisions in good faith with the Province, Metro Vancouver and any other involved party to determine if there is a solution acceptable to all affected parties.</p>	<p>Metro Vancouver works with Vancouver and Delta within their Tripartite agreement.</p>

**Strategy 4.2: Ensure a disposal site is available for C&D waste**

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>4.2.1 MV Will:</b> Assess long-term disposal of construction and demolition (C&amp;D) waste remaining after recycling in collaboration with the private sector, neighbouring regional districts and First Nations communities.</p>	<p>This is primarily covered under 2.4.3 which is Metro Vancouver’s ongoing monitoring of the regional flows and recycling and disposal capacity of C&amp;D wastes. Metro Vancouver is also business casing the development of a new alternative fuel and recyclables recovery facility for C&amp;D wastes along with small vehicle waste, to reduce the volume of material going to disposal. See also action 1.1.8</p>
<p><b>4.2.2 MV Will:</b> Identify disposal sites for C&amp;D waste remaining after recycling that will be available when existing disposal facilities reach their capacity.</p>	<p>This is primarily covered under 2.4.3 which is Metro Vancouver’s ongoing monitoring of the regional flows and recycling and disposal capacity of C&amp;D wastes.</p>

### Strategy 4.3: Establish contingency disposal sites

ISWRMP Strategy and Actions	Current Status of Key Strategies and Actions in the ISWRMP
<p><b>4.3.1 MV Will:</b> Ensure adequate landfill capacity for:</p> <ul style="list-style-type: none"> <li>(a) non-combustible and non-recyclable material; and</li> <li>(b) municipal solid waste in excess of waste-to-energy and in-region landfill capacity (including allowances for variability in waste flows and short-term operational disruption), and non-recyclable ash.</li> </ul>	<p>System disposal capacity is sufficient for the region’s requirements. Projected waste flows are assessed prior to any procurement to ensure suitable capacity is secured.</p> <p>With the closure of the Cache Creek Landfill in 2016, contingency disposal was required. Interim contracts for contingency disposal were established with new contingency operations beginning April 2018.</p>
<p><b>4.3.2 MV Will:</b> If sufficient waste-to-energy or in-region landfill capacity is not available, this Plan explicitly permits Metro Vancouver to seek, through an appropriate procurement process, the best available out-of-region landfill(s) for the disposal of remaining waste, subject to that facility having appropriate permits, from the local permitting jurisdiction in which it is located, to accept such waste.</p> <ul style="list-style-type: none"> <li>(a) Categories of evaluation for a contingency landfill will include, but not necessarily be limited to cost, air emissions, GHG emissions, energy benefit and, where appropriate, completion of a satisfactory human health impact assessment.</li> <li>(b) Monitor contingency disposal site(s) for performance and compliance.</li> </ul>	<p>Metro Vancouver continues to monitor waste flow projections and remaining disposal capacity and will take into consideration environmental, social and economic factors when determining alternative disposal sites when and if deemed necessary.</p> <p>With the closure of the Cache Creek Landfill in 2016, contingency disposal was required. Interim contracts for contingency disposal were established with new contingency operations beginning April 2018.</p>

### 3.0 DETAILED ISWRMP PERFORMANCE MEASURES

Recycling and solid waste management is categorized into three sectors: Residential; Commercial and Institutional; Construction and Demolition (C&D).

In 2020, 2,261,038 tonnes of material were recycled and diverted from disposal in Metro Vancouver. This amounts to 64% of the waste material generated in the region. A remaining 1,245,314 tonnes of solid waste were disposed of.

Garbage and recycling from single family residences are collected mostly in dedicated vehicles, by municipalities; therefore, single family residential garbage and recycling percentages have a reasonably high degree of certainty.

However, garbage from multi-family residences is usually mixed with garbage from commercial/institutional businesses, as they are both typically collected by the private sector on the basis of efficient vehicle routing. As a result, multi-family residential garbage and recycling percentages are less certain, and should be considered approximate only. For the 2018 calendar year, the multi-family residential recycling rate was estimated to be about 38% (including EPR recyclables).

Additionally, Metro Vancouver estimates that no significant quantities of municipal solid waste from commercial generators and multi-family residential buildings were exported from the region to disposal in calendar 2020 due to the implementation of the variable rate tipping fee and the generator levy in 2018.

The following table presents recycling and solid waste quantities for each sector. In 2020, Metro Vancouver has estimated the distribution of EPR recycling tonnages to the single family, multi-family and commercial/institutional sectors (see note 3 in Table 1). Appendix 1 includes a similar table with a comparison to the previous year.

WASTE SECTOR	DISPOSED (tonnes)	RECYCLED (tonnes)	RECYCLING RATE <sup>(3)</sup> (%)	DISPOSED (tonnes/capita)	DISPOSED (tonnes/household)
<b>Residential</b>	<b>509,038</b>	<b>631,627</b>	<b>55%</b>	<b>0.18</b>	<b>0.47</b>
Single Family <sup>(1)</sup> Population <sup>(4)</sup> = 1,634,477	269,485	485,419	64%	0.16	0.53
Multi-Family <sup>(2)</sup> Population <sup>(4)</sup> = 1,132,476	239,554	146,208	38%	0.21	0.42
<b>Commercial/Institutional <sup>(2)</sup></b> Employees <sup>(4)</sup> = 1,411,980	<b>354,268</b>	<b>278,507</b>	<b>44%</b>	<b>0.13</b>	<b>0.33</b>
<b>Construction &amp; Demolition <sup>(5)</sup></b>	<b>382,007</b>	<b>1,350,904</b>	<b>78%</b>	<b>0.14</b>	<b>0.36</b>
<b>TOTAL</b>	<b>1,245,314</b>	<b>2,261,038</b>	<b>64%</b>	<b>0.45</b>	<b>1.16</b>

Notes:

- 1 *Reported tonnes of disposed and recycled waste are obtained from municipal reports, private recycling and processing facility records, landfill records, or product stewardship association records. This includes “Small Load” tonnages.*
- 2 *Estimated tonnes of disposed waste are based on per capita multi-family disposal rates and the total weigh scale reports for ‘Commercial’ waste. A calculated portion of that total is then attributed to each sector. Multi-family recycling is reported by municipalities and combined with estimated “Small Load” tonnages.*
- 3 *The total recycling rate includes the EPR tonnages. The recycling rates for individual sectors also include EPR tonnages, based on estimates of the relative contributions to EPR tonnages from single family homes (54%), multi-family homes (36%), and businesses (10%) with the exception of Recycle BC tonnages that are allocated 60% to the single family sector and 40% to the multi-family sector.*
- 4 *Population, Employment and Housing figures are based on 2020 projections provided by Metro Vancouver’s Regional Planning Department based on 2016 census data.*
- 5 *Reported tonnes of recyclable materials and disposed waste are obtained from private licensed brokers, composters and transfer stations, and from unlicensed recycling facilities.*

## **METRO VANCOUVER’S RECYCLING AND SOLID WASTE MANAGEMENT SYSTEM**

Metro Vancouver’s integrated recycling and solid waste management system provides service to the residents and businesses of 21 municipalities, one Electoral Area and one Treaty First Nation. Waste from the City of Abbotsford was received at the Matsqui Transfer Station until its closure on November 1, 2015, and waste from Thompson-Nicola Regional District, the Village of Cache Creek, and the Village of Ashcroft was delivered to the Cache Creek Landfill until its closure at the end of 2016, but is not tabulated with the historical Metro Vancouver Recycling and Solid Waste Quantities.

### **Recycling**

Municipalities historically have provided recycling services for the single family residential sector, and some parts of the multi-family residential and commercial/institutional sectors. In 2014, a private sector industry stewardship organization MMBC (now RecycleBC) assumed responsibility for recycling Packaging and Paper Products from single family and multi-family homes, as legislated by the Province. Most commercial/institutional, and C&D recyclables are managed by the private sector (although industry stewardship program is expected to take over for commercial/institutional businesses in the coming years). The following table presents the quantities and types of recyclables collected in 2018. In this table, “Take Back” (EPR) recyclables have been presented separately instead of allocating to residential and commercial/institutional sectors.

MATERIAL TYPE	TOTAL <sup>(1)</sup> (tonnes)
Asphalt	295,300
Batteries	12,952
Concrete	802,701
Electronic & Electrical Equipment	11,650
Paper/Paper Products	313,830
Glass	57,267
Gypsum	56,782
Household Hazardous Waste	20,406
Metal	73,636
Other	7,001
Plastic	44,587
Textiles	639
Tires	22,068
Wood	152,487
Yard & Food	389,732
<b>TOTAL</b>	<b>2,261,038</b>

### Disposed Waste

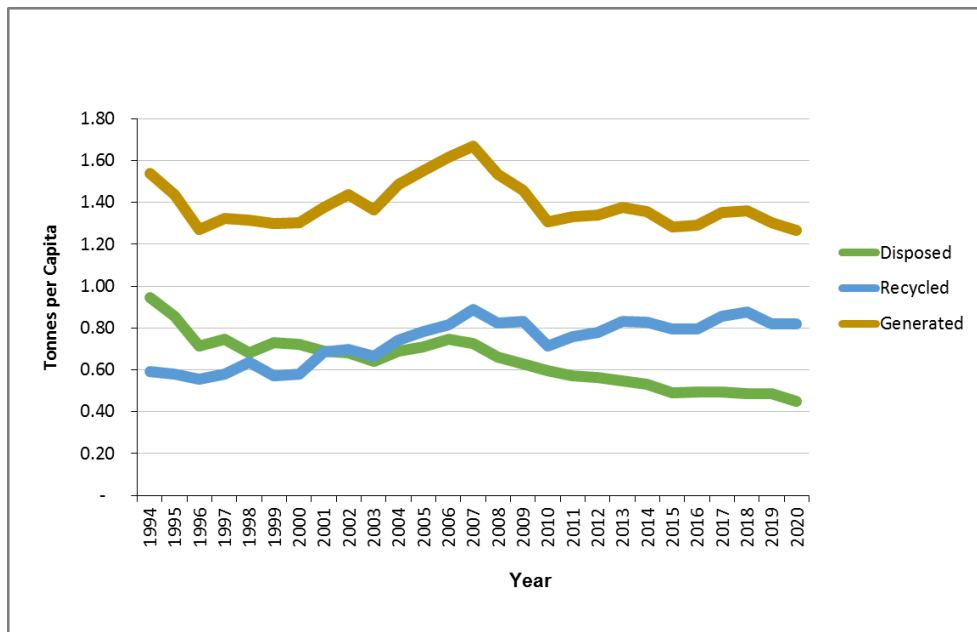
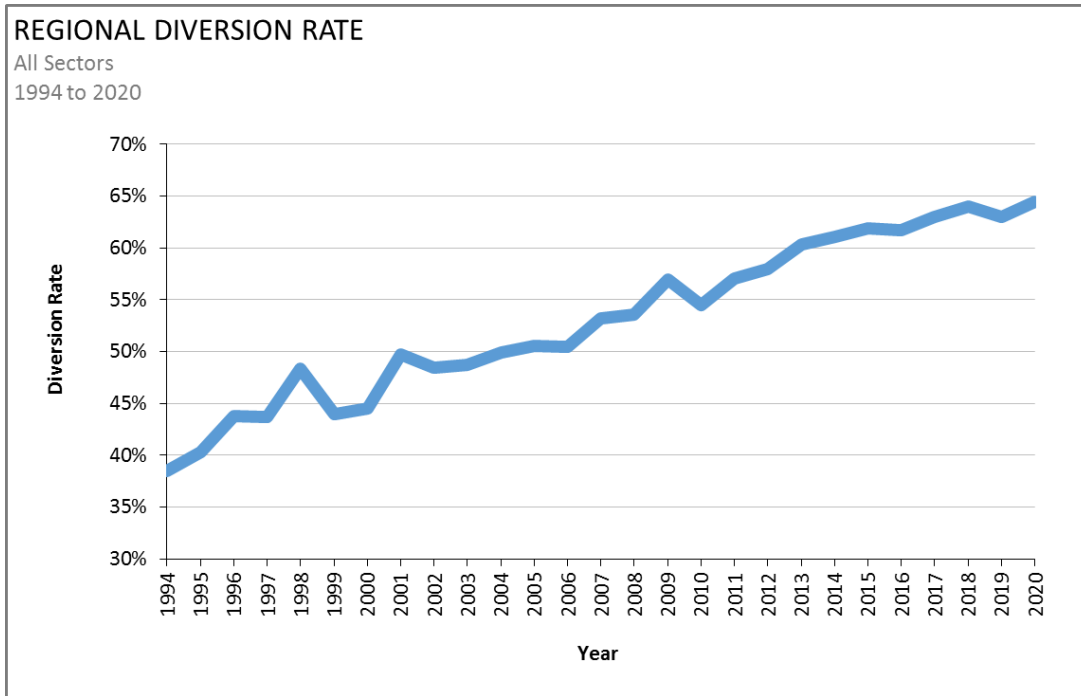
Residential and Commercial/Institutional waste disposal is handled through the regional solid waste management system. In 2020, the Regional Facilities consisted of:

- Six recycling and waste centres
- Vancouver Landfill
- Waste-to-Energy Facility in Burnaby
- Contracted out-of-region contingency landfills

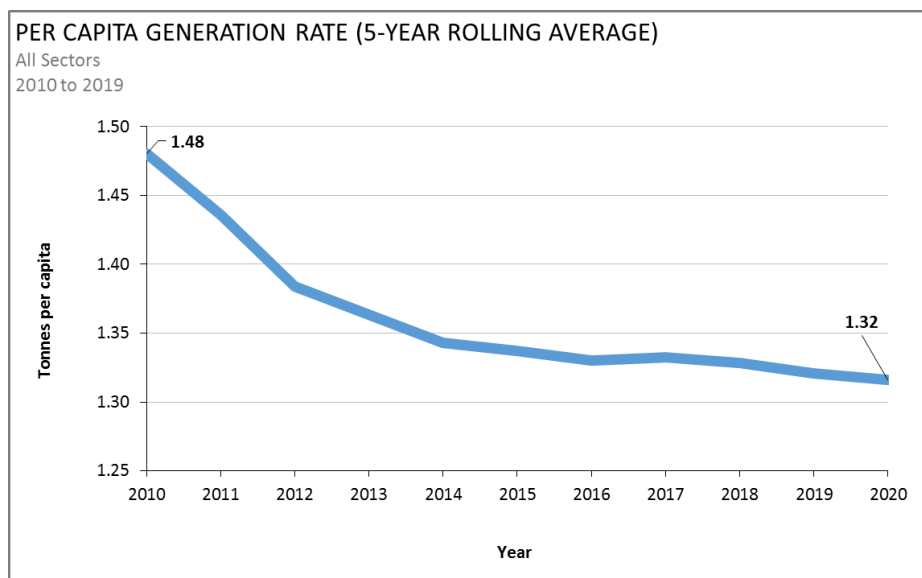
All municipal solid waste delivered to the disposal facilities (landfill and waste-to-energy) is accounted in Metro Vancouver's disposal rate (including C&D and material disposed out of region). The current per capita disposal rate in the region is 0.45 tonnes per person.

C&D waste is handled separately from the regional solid waste management system, and is disposed at a private landfill, the Vancouver Landfill or at one of several other landfills that are not under Metro Vancouver jurisdiction. In 2020, the Residential, Commercial/Institutional, and C&D sectors in Metro Vancouver disposed of a total 1,245,314 tonnes of waste to the regional system and private disposal facilities.

In 2020, Metro Vancouver residents and businesses achieved an overall recycling or diversion rate of 64%. Figures below show the regional diversion rate from all waste sectors, and the total per capita generation, disposal and recycling rates for the region since 1994, respectively:



The following table shows the reduction in per capita waste generation (5 yr rolling average) since 2010:



The following table shows Metro Vancouver’s regional waste and recycling figures by year:

YEAR	REGIONAL POPULATION	REGIONAL HOUSEHOLDS	TOTAL GENERATED (tonnes)	TOTAL RECYCLED (tonnes)	TOTAL DISPOSED (tonnes)	RECYCLING RATE (%)	GENERATION RATE (tonnes/capita)	DISPOSAL RATE (tonnes/capita)	DISPOSAL RATE (tonnes/household)
1994	1,732,567		2,663,581	1,025,921	1,680,750	39%	1.54	0.97	
1995	1,784,656		2,561,858	1,032,095	1,529,763	40%	1.44	0.86	
1996	1,906,492		2,419,323	1,058,441	1,360,882	44%	1.27	0.71	
1997	1,954,523		2,589,044	1,131,958	1,457,086	44%	1.32	0.75	
1998	1,984,743		2,609,913	1,261,680	1,348,233	48%	1.31	0.68	
1999	2,013,201		2,618,538	1,151,130	1,467,408	44%	1.30	0.73	
2000	2,041,399		2,657,076	1,183,611	1,473,465	45%	1.30	0.72	
2001	2,073,662		2,851,208	1,418,489	1,432,719	50%	1.37	0.69	
2002	2,102,244		2,903,894	1,470,445	1,433,449	51%	1.38	0.68	
2003	2,128,965		2,775,455	1,414,390	1,361,065	51%	1.30	0.64	
2004	2,153,998		3,072,702	1,595,999	1,476,703	52%	1.43	0.69	
2005	2,188,573		3,245,796	1,701,414	1,544,382	52%	1.48	0.71	
2006	2,218,026	817,040	3,434,617	1,794,613	1,640,004	52%	1.55	0.74	2.01
2007	2,251,887	831,909	3,598,142	1,980,751	1,617,391	55%	1.60	0.72	1.94
2008	2,273,095	836,304	3,366,123	1,866,892	1,499,231	55%	1.48	0.66	1.79
2009	2,314,163	865,017	3,374,840	1,922,840	1,452,001	57%	1.46	0.63	1.68
2010	2,351,496	879,874	3,075,392	1,676,117	1,399,275	55%	1.31	0.60	1.59
2011	2,395,520	898,273	3,188,348	1,817,446	1,370,902	57%	1.33	0.57	1.53
2012	2,408,559	909,994	3,228,305	1,871,339	1,356,966	58%	1.34	0.56	1.49
2013	2,430,305	920,375	3,348,498	2,020,114	1,328,384	60%	1.38	0.55	1.44
2014	2,465,031	939,212	3,343,471	2,040,280	1,303,191	61%	1.36	0.53	1.39
2015	2,497,052	943,072	3,202,979	1,982,137	1,220,842	62%	1.28	0.49	1.29
2016	2,546,595	943,072	3,295,830	2,039,569	1,256,261	62%	1.29	0.49	1.33
2017 <sup>(1)</sup>	2,610,929	984,640	3,525,224	2,234,055	1,291,169	63%	1.35	0.49	1.31
2018	2,648,493	998,930	3,599,801	2,317,050	1,282,752	64%	1.36	0.48	1.28
2019	2,681,878	1,019,526	3,490,425	2,191,421	1,299,005	63%	1.30	0.48	1.27
2020	2,766,953	1,075,454	3,506,352	2,261,038	1,245,314	64%	1.27	0.45	1.16



1 2017 demographics data has been updated from the previously published 2017 annual report to reflect new information that has become available

The following table is an estimate of the amount of reuse in the region in 2018:

MATERIAL CATEGORY	ANNUAL REUSE (tonnes) ROUNDED VALUE (to nearest 100 tonnes)
Textiles and Accessories - Sold	4,300
Textiles and Accessories - Industrial Wipes	500
EPR Programs	17,200
Food	4,800
Hotels and Hospitality Sector	400
Office Furniture	1,200
IT Equipment	1,400
Construction/ Demolition Materials	4,800
On-Line for Selected Materials	27,000
<b>TOTAL</b>	<b>61,600</b>

The following table highlights the single family residential recycling and solid waste figures:

YEAR	SINGLE FAMILY RESIDENTIAL POPULATION	SINGLE FAMILY RESIDENTIAL HOUSEHOLDS	SECTOR GENERATED (tonnes)	SECTOR RECYCLED (tonnes) <sup>1</sup>	SECTOR DISPOSED (tonnes)	SECTOR RECYCLING RATE (%)	SECTOR GENERATION RATE (tonnes/capita)	SECTOR DISPOSAL RATE (tonnes/capita)	SECTOR DISPOSAL RATE (tonnes/household)
2006	1,389,809	428,045	778,629	336,577	442,052	43%	0.56	0.32	1.03
2007	1,399,185	434,163	783,878	352,455	431,423	45%	0.56	0.31	0.99
2008	1,409,040	428,045	741,783	324,093	417,690	44%	0.53	0.30	0.98
2009	1,419,442	443,894	749,536	330,294	419,242	44%	0.53	0.30	0.94
2010	1,429,495	447,932	721,746	344,450	377,296	48%	0.50	0.26	0.84
2011	1,440,334	454,662	732,112	363,594	368,518	50%	0.51	0.26	0.81
2012	1,476,411	456,259	784,196	439,077	345,118	56%	0.53	0.23	0.76
2013	1,484,766	462,170	761,169	456,822	304,347	60%	0.51	0.20	0.66
2014	1,494,336	464,955	774,877	482,090	292,787	62%	0.52	0.20	0.63
2015	1,511,428	471,157	809,500	533,861	275,639	66%	0.54	0.18	0.59
2016	1,533,062	476,559	764,037	491,190	272,848	64%	0.50	0.18	0.57
2017 <sup>(2)</sup>	1,535,480	472,530	748,410	477,832	270,578	64%	0.49	0.18	0.57
2018	1,557,308	476,600	704,462	447,639	256,824	64%	0.45	0.16	0.54
2019	1,571,441	481,304	694,246	439,730	254,516	63%	0.44	0.16	0.53
2020	1,634,477	504,527	754,903	485,419	269,485	64%	0.46	0.16	0.53

1 Includes distributed EPR Recyclables from 2012 onward

2 2017 demographics data has been updated from the previously published 2017 annual report to reflect new information that has become available

The following table outlines the amount of construction and demolition waste disposed to the Vancouver landfill and to private C&D landfills since 2010:

**C&D Waste Disposal by Facility (Tonnes)**

Year	Vancouver Landfill	Private Facilities	Total
2010	140,734	165,331	306,065
2011	196,498	169,961	366,459
2012	185,317	173,374	358,691
2013	159,303	233,039	392,342
2014	132,721	260,951	393,672
2015	124,044	266,338	390,382
2016	118,168	232,908	351,076
2017	126,513	245,008	371,521
2018	86,663	277,909	364,572
2019	61,178	315,664	376,842
2020	44,138	326,654	370,792

The following table outlines the amount of residential and commercial waste disposed to regional disposal sites, and outside of the regional system since 2010:

**Residential & Commercial Waste Disposal by Facility (Tonnes)**

Year	Cache Creek Landfill	Vancouver Landfill	Waste to Energy	Contingency Disposal	Out of Region (Estimated)
2010	396,384	427,083	284,458		
2011	280,249	456,229	281,139		
2012	242,902	469,273	281,260		50,000
2013	217,072	395,253	280,138		60,000
2014	207,191	355,594	275,260		100,000
2015	206,198	366,123	256,402		30,000
2016	134,866	518,324	254,256		
2017		569,126	259,748	85,779	
2018		611,798	253,126	58,679	
2019		639,474	253,184	55,689	
2020		615,596	244,362	35,340	

The following table outlines the amount of wastes of different types (municipal solid wastes, construction & demolition wastes, wastewater treatment plant residuals, water treatment residuals,

bottom ash from the waste-to-energy facility, and industrial waste (e.g. pulp and paper wastes) disposed at the Vancouver landfill since 2010:

**Vancouver Landfill Waste Tonnages (tonnes)**

Year	MSW	C&D	WWTP Residuals	WT Residuals	Bottom Ash	Industrial	Total
2010	427,083	140,734	6,545	6,037	46,410		580,399
2011	456,229	196,498	5,775	6,542	46,027		665,044
2012	469,273	185,317	6,050	7,295	44,925	48,347	716,282
2013	395,253	159,303	7,346	6,731	32,538		601,171
2014	355,594	132,721	7,377	7,595	44,861	599	548,747
2015	366,123	124,044	7,312	9,280	43,413		550,172
2016	518,324	118,168	8,028	3,944	43,068		691,532
2017	569,126	126,513	4,399	1,652	35,013		736,703
2018	611,798	86,663	18,737*	710	0**		717,908
2019	639,474	61,178	20,854*	0	16,755**		738,261
2020	615,596	44,138	37,403*	1,417	41,478		740,032

\* Includes 15,173 tonnes Iona Grit Dump in addition to typical WWTP Residuals

\*\* About 76,000 tonnes of bottom ash from the Waste to Energy Facility was used as part of the construction of the new United Boulevard Recycling and Waste Centre from October 2017 until August 2019.

The following table outlines the amount of fly ash disposed from the waste-to-energy facility since 2010. Fly ash has been managed under contract at a private landfill in Oregon since mid-2017:

**Fly Ash Disposal (Out of Region\*) (tonnes)**

2010	12,265
2011	11,964
2012	11,841
2013	11,710
2014	10,720
2015	9,657
2016	10,268
2017	10,450
2018	10,479
2019	9,888
2020	8,658

\* Fly ash has sent to a private landfill in Oregon since July 2017

Goal	Progress Measure	Progress Detail														
GOAL 1 Minimize waste generation	Waste generation measures	Waste generated by sector (tonnes)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Average / Change 2010-2020
	Waste generation quantities for all sectors tracked year-over-year and on a rolling five-year basis	Residential (Single and Multi-Family)	978,704	1,001,419	962,953	973,394	1,077,776	1,061,571	1,070,600	1,083,638	1,087,866	1,082,557	1,079,613	1,060,179	1,140,665	1,061,892
		C/I (Commercial and Institutional)	1,141,268	976,733	818,789	676,021	709,131	677,458	690,789	626,104	741,751	775,282	734,304	674,837	632,776	705,204
		C&D (Construction and Demolition)	1,128,846	1,272,579	1,104,794	1,409,987	1,441,399	1,609,469	1,582,082	1,493,236	1,453,426	1,667,385	1,785,885	1,755,409	1,732,911	1,548,726
		<i>Total generated</i>	<i>3,366,123</i>	<i>3,374,840</i>	<i>3,075,392</i>	<i>3,188,348</i>	<i>3,228,305</i>	<i>3,348,498</i>	<i>3,343,471</i>	<i>3,202,979</i>	<i>3,283,044</i>	<i>3,525,224</i>	<i>3,599,801</i>	<i>3,490,425</i>	<i>3,506,352</i>	<i>3,344,713</i>
		<i>Total generated per capita</i>	<i>1.53</i>	<i>1.46</i>	<i>1.31</i>	<i>1.33</i>	<i>1.34</i>	<i>1.38</i>	<i>1.36</i>	<i>1.28</i>	<i>1.29</i>	<i>1.35</i>	<i>1.36</i>	<i>1.30</i>	<i>1.27</i>	<i>1.32</i>
	Increase of product stewardship initiatives by senior governments to more than two initiatives every three years	New product stewardship initiatives by year	0	4	2	3	3	0	1	2	0	0	1	0	0	12
	Monitor performance of EPR programs to ensure shift in responsibility from public to private sector achieves a reduction in total waste generated	Waste diverted through EPR programs (tonnes)	117,602	124,110	130,384	128,946	124,048	128,224	205,094	245,078	246,131	256,552	248,064	233,905	237,724	82%
		Est. EPR materials disposed in waste stream <sup>(1)</sup> (tonnes)	60,500	27,000	27,500	28,900	28,800	25,700	109,100	99,700	100,800	106,900	106,900	104,800	103,600	277%
		Est. EPR materials generated (tonnes)	178,100	151,100	157,900	157,800	152,800	153,900	314,200	344,800	346,900	363,500	355,000	338,700	341,300	116%
% EPR materials generated diverted		66%	82%	83%	82%	81%	83%	65%	71%	71%	71%	70%	69%	70%	-13%	
GOAL 2 Maximize reuse, recycling, and material recovery	Diversion measures		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Change 2010-2020
	Overall diversion rate tracked year-over-year	Overall diversion rate	55%	57%	55%	57%	58%	60%	61%	62%	62%	63%	64%	63%	64%	9%
	Disposal rate per capita tracked year-over year (MSW + DLC).	Tonnes per-capita disposed	0.66	0.63	0.60	0.57	0.56	0.55	0.53	0.49	0.49	0.49	0.48	0.48	0.45	-25%
	Diversion rate per-capita tracked year-over-year	Tonnes per-capita diverted	0.82	0.83	0.71	0.76	0.73	0.83	0.83	0.79	0.80	0.86	0.87	0.82	0.82	15%
	Tracking of material recycling tonnage	Material recycled (tonnes)	1,866,892	1,922,840	1,676,117	1,817,446	1,871,339	2,020,114	2,040,280	1,982,137	2,026,783	2,234,055	2,317,050	2,191,421	2,261,038	35%
	Monitor performance of EPR programs to ensure shift in responsibility from public to private sector achieves an increase in material reused, recycled, and recovered	Material capture through EPR programs (tonnes)	117,602	124,110	130,384	128,946	124,048	128,224	205,094	245,078	246,131	256,552	248,064	233,905	237,724	82%

Energy measures		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Change 2010-2020	
		Energy produced from solid waste and beneficially used in gigajoules (GJ).	<b>Total material sent to waste-to-energy facility (Tonnes)</b>													
MV-WTEF (tonnes waste disposed)	274,291		276,740	284,458	281,139	281,260	280,138	275,260	254,381	254,256	259,748	253,126	253,184	244,362	n/a	
<b>Energy Purchased ( Gigajoules )</b>																
MV-WTEF (BC Hydro Electricity)	72,151		75,966	73,751	72,951	74,526	78,017	77,524	77,500	79,160	76,309	75,679	76,165	73,956	0%	
MV-WTEF (Fortis Natural Gas)	13,768		22,029	20,103	13,375	16,306	12,544	11,317	19,729	16,088	20,633	40,125	40,240	70,259	250%	
<b>Energy Produced and Delivered to End Users ( Gigajoules )</b>																
MV-WTEF (Electricity)	459,293		474,944	505,198	500,881	600,292	637,885	537,110	558,731	624,053	611,562	587,633	621,378	544,558	8%	
MV-WTEF (Steam to Norampac)	714,298		555,750	685,054	623,798	-	-	-	-	-	-	-	-	-	n/a	
Cache Creek LF (LFG)	-		-	-	-	-	-	-	75,686	113,530	-	-	-	-	n/a	
Coquitlam LF (LFG to Catalyst)	12,356		6,217	16,452	11,597	-	-	-	-	-	-	-	-	-	n/a	
Vancouver LF (LFG to Maxim/VF Clean Energy) <sup>(2)</sup>	690,172		505,256	629,820	587,712	389,430	584,302	749,353	647,442	522,732	708,101	728,876	578,251	350,280	-44%	
<b>Total</b>	<b>1,876,119</b>		<b>1,542,167</b>	<b>1,836,524</b>	<b>1,723,988</b>	<b>989,722</b>	<b>1,222,187</b>	<b>1,286,463</b>	<b>1,281,859</b>	<b>1,260,315</b>	<b>1,319,664</b>	<b>1,316,508</b>	<b>1,199,629</b>	<b>894,838</b>	<b>-51%</b>	
Energy produced from solid waste and beneficially used in gigajoules (GJ).	<b>Energy Produced but Not Used ( Gigajoules )</b>															
	MV-WTEF (low grade heat loss)		Future district heating systems may make use of unused low grade heat.													
	Cache Creek LF (LFG flared)		204,282	237,978	212,823	349,635	386,100	450,684	512,655	352,714	595,100	-	-	-	-	n/a
	Coquitlam LF (LFG flared)	0	0	0	5,564	16,187	16,200	14,248	15,728	14,548	12,372	11,086	13,091	15,807	n/a	
	Vancouver LF (LFG flared)	145,910	233,961	254,757	148,890	622,661	507,533	456,064	554,845	729,902	584,636	571,643	635,450	920,123	261%	
<b>Total</b>	<b>350,192</b>	<b>471,939</b>	<b>467,580</b>	<b>504,089</b>	<b>1,024,947</b>	<b>974,417</b>	<b>982,967</b>	<b>923,287</b>	<b>1,339,550</b>	<b>597,008</b>	<b>582,729</b>	<b>648,541</b>	<b>935,930</b>	<b>100%</b>		
Total Greenhouse gases emitted and avoided tracked year-over-year in metric tonnes (t) of CO2E	<b>Carbon Dioxide equivalents emitted and avoided ( t CO2E )</b>															
	MV-WTEF - Emitted <sup>(5)</sup>	115,229	116,663	119,790	118,069	120,766	115,120	108,708	112,060	118,272	118,802	128,841	121,503	144,261	20%	
	MV-WTEF (Electricity) <sup>(2)</sup>	(3,190)	(3,298)	(3,508)	(3,478)	(4,169)	(2,333)	(1,488)	(1,552)	(1,850)	(1,813)	(1,742)	(1,842)	(1,614)	-54%	
	MV-WTEF (Heat from Steam) <sup>(3)</sup>	(47,074)	(36,625)	(45,146)	(41,109)	-	-	-	-	-	-	-	-	-	n/a	
	<b>MV-WTEF - Net</b>	<b>64,966</b>	<b>76,740</b>	<b>71,136</b>	<b>73,482</b>	<b>116,597</b>	<b>112,788</b>	<b>107,221</b>	<b>110,508</b>	<b>116,422</b>	<b>116,989</b>	<b>127,099</b>	<b>119,661</b>	<b>142,647</b>	<b>101%</b>	
	Cache Creek LF - Emitted <sup>(4)</sup>	132,974	131,113	137,899	107,292	95,667	65,674	45,749	54,625	75,625	-	-	-	-	n/a	
	Cache Creek LF (Avoided)	-	-	-	-	-	-	-	(76)	(130)	-	-	-	-	n/a	
	<b>Cache Creek LF - Net</b>	<b>132,974</b>	<b>131,113</b>	<b>137,899</b>	<b>107,292</b>	<b>95,667</b>	<b>65,674</b>	<b>45,749</b>	<b>54,549</b>	<b>75,495</b>	-	-	-	-	<b>n/a</b>	
	Coquitlam LF - Emitted <sup>(4)</sup>	22,697	23,506	16,967	15,852	10,072	7,297	6,751	5,627	5,184	5,285	5,183	5,175	4,858	-71%	
	Coquitlam LF (LFG to Boilers) <sup>(3)</sup>	(611)	(307)	(813)	(573)	-	-	-	-	-	-	-	-	-	n/a	
	<b>Coquitlam LF - Net</b>	<b>22,086</b>	<b>23,199</b>	<b>16,154</b>	<b>15,279</b>	<b>10,072</b>	<b>7,297</b>	<b>6,751</b>	<b>5,627</b>	<b>5,184</b>	<b>5,285</b>	<b>5,183</b>	<b>5,175</b>	<b>4,858</b>	<b>-70%</b>	
	Vancouver LF - Emitted <sup>(4)</sup>	496,087	562,851	510,472	580,543	472,382	404,259	383,348	209,100	184,000	241,762	174,267	231,057	188,899	-63%	
	Vancouver LF (LFG to Maxim/VF Clean Energy) <sup>(2)</sup>	(34,136)	(24,990)	(31,151)	(29,068)	(19,261)	(28,900)	(37,063)	(32,044)	(25,875)	(35,313)	(36,349)	(28,837)	(17,468)	-44%	
	<b>Vancouver LF - Net</b>	<b>461,951</b>	<b>537,861</b>	<b>479,321</b>	<b>551,474</b>	<b>453,121</b>	<b>375,359</b>	<b>346,285</b>	<b>177,056</b>	<b>158,125</b>	<b>206,449</b>	<b>137,918</b>	<b>202,219</b>	<b>171,431</b>	<b>-64%</b>	
	<b>Roosevelt Regional LF - Net</b>										<b>3,278</b>	<b>2,586</b>	<b>2,309</b>	<b>1,465</b>	n/a	
<b>Columbia Ridge LF - Net</b>										<b>3,657</b>	<b>2,280</b>	<b>2,309</b>	<b>1,465</b>	n/a		
<b>Total Emitted</b>	<b>766,987</b>	<b>834,134</b>	<b>785,129</b>	<b>821,756</b>	<b>698,887</b>	<b>592,350</b>	<b>544,556</b>	<b>381,412</b>	<b>383,081</b>	<b>365,849</b>	<b>308,290</b>	<b>357,735</b>	<b>338,018</b>	<b>-57%</b>		
<b>Total Avoided</b>	<b>(85,010)</b>	<b>(65,220)</b>	<b>(80,619)</b>	<b>(74,229)</b>	<b>(23,430)</b>	<b>(31,232)</b>	<b>(38,551)</b>	<b>(33,672)</b>	<b>(27,855)</b>	<b>(37,126)</b>	<b>(38,091)</b>	<b>(30,679)</b>	<b>(19,082)</b>	<b>-76%</b>		
<b>Total Net Emissions</b>	<b>681,977</b>	<b>768,914</b>	<b>704,510</b>	<b>747,527</b>	<b>675,457</b>	<b>561,118</b>	<b>506,006</b>	<b>347,740</b>	<b>355,226</b>	<b>328,724</b>	<b>270,200</b>	<b>327,055</b>	<b>318,936</b>	<b>-55%</b>		
Disposal measures		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Change 2010-2020	
	Quantity of treated and untreated waste per capita going to landfill is tracked year-over-year	0.54	0.51	0.47	0.45	0.45	0.43	0.42	0.39	0.39	0.40	0.39	0.39	0.36	-24%	
	Metro Vancouver will carry out periodic waste composition audits	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	n/a	

Notes:

- (1) Based on Metro Vancouver Waste Composition monitoring of products in EPR programs at the end of the particular year.
- (2) Emission reduction calculated based on avoided hydro electricity generation.
- (3) Emission reduction calculated based on avoided natural gas use.
- (4) LFG emissions based on publicly reported numbers, and account for the current methane Global Warming Potential (GWP) of 25, and a flare destruction efficiency of 98%. Methane oxidation in the landfill cover is not included.
- (5) WTEF emissions for 2012 onwards have been calculated using an improved methodology based on a continuous emissions monitoring system (CEMS) and stack test data; emissions from 2010-2011 have been backcast to align with new methodology

